The Chemical Age

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The Prevention of Slumps

THE problem of the prevention of alternate periods of industrial depression and "boom" is being deeply considered by most thinking men engaged in industry. They see our industry working feverishly, and producing in the main goods for home consumption, or the modern equivalent of bows and arrows for defence against hypothetical, but none the less potentially real, foes; very little, however, is manufactured for export. They see that, in a few years, the Government purchases of munitions and armaments will cease; they see that home industry will have made up the deficiencies in plant that have been allowed to accumulate since the war; and they ask, what then? Shall we enter another slump worse than the one out of which we have just climbed? Let it be clear that it is in no spirit of pessimism that this subject is broached, but in the belief that if it could be tackled scientifically now, while trade is at the peak, it could be tackled successfully, but if left until confidence has been again sapped, the difficulties will be enormously enhanced.

Those who have publicly discussed the problem have made certain suggestions. Mr. Roosevelt has insisted that the new prosperity shall be built upon more stable foundations than the old. What his ideas are can presumably be seen from what he is doing, but whether or not they are sound, or whether the same principles could be applied in countries that have not the vast spaces and the great natural resources of the United States, remains uncertain. The Swedish Government, speaking through its Minister of Finance, believes that at a time of good trade, such as the present, the Government should no longer endeavour to stimulate trade in general, but should devote its attention to any trades or districts that lag behind. Unfortunately, the necessity for rearmament has caused our own Government to proceed in exactly the contrary direction and to superimpose upon an already highly-burdened industry the additional huge armaments construction. The Swedish proposal, which is apparently based on an avoidance of public measures that would undesirably intensify the boom, has already been reversed in most European countries.

Mr. J. M. Keynes, the famous economist, has contributed a series of articles to the "Times" with the avowed intention of stimulating politicians, bankers, industrialists and economists to grapple with a scientific problem which they have never tried to solve before. Mr. Keynes takes into account the rearmament programme, and he notes also the inactivity of our export industries. He also, very rightly, sees nothing wrong with such prosperity as we now enjoy, but states that our object should be to stabilise it and to distribute it more widely to make constructive preparations against the future. He believes that in our favour we shall have an improved export trade with the raw-material countries in the not far distant future, but he believes that we must meet the menace of "the next slump" by new policies and with boldness. He believes that we must slowly reconstruct our social system so as to attain a decent level of consumption for everyone, and in particular that taxation should be directed to leave as much income as possible for those who have most need to consume more. He would have us defer public expenditure as far as possible until needed to stimulate trade; an authority should be set up to make sure that detailed plans are prepared for developments by water, gas, electricity, building and municipal authorities—large projects, "acts of constructive imagination." He also holds that our monetary policy should be used to stimulate these and similar projects. Whether these proposals are sound must be a matter of opinion, but it is certain that some are in a large measure palliatives; public works cannot go on for ever, and the most grandiose schemes can be propounded, but have to be paid for by the taxpayer or the ratepayer in the long run.

We have a suspicion that, much as all desire to see a policy that will avoid trade cycles, it does not depend upon this country alone, but upon concerted action by the world as a whole. The troubled state of Europe, to go no farther afield, does not suggest that concerted action in the economic field will be particularly easy to attain.

On the other hand, there are some people who hold that the causes of slumps are national and can only be dealt with effectively by the Government; it has been suggested that there should be set up a Ministry of Trade with the sole object of planning ahead to avoid trade depressions. One essential difficulty lies in the fact that business houses, and still more, local authorities, cannot be persuaded to purchase except in times when everyone else is buying. In so far as organised and conscious effort can prevent the next slump we would suggest that to-day large *unnecessary* schemes should be deferred until the market is becoming easier, that trade agreements should be made wherever possible with other countries that would remove as many as possible of the obstacles to free trading; but that in the outcome the final solution of the difficulty is the continuous improvement in our social system throughout the world to increase the purchasing power of the individual. When we have done all this, what will be the effect upon our economic balance of the reduction in the birth-rate, and, consequently, in the numbers of the population, in coming generations, that now seems inevitable?

Notes and Comments

The Chemist in Industry

FEW subjects are more provocative of discussion among chemists than the relation of their work to industry, and the Society of Chemical Industry is to be commended upon having brought together eight leaders in different spheres to contribute to the symposium at Manchester last week. The meeting was concerned with "The Chemist: His Induction, Functions, Influence and Rewards," and although it is true that only a very small percentage of the members found it possible to attend there was no lack of enthusiasm in entering into the discussion. The eight papers had been circulated in advance and the discussion was concerned mainly with the problem of the relative importance of general and specialist training and even of university education and training in industry. Between the purely academic speaker who was primarily interested in the university and the industrial man who owed his position in chemistry to the exercise of common sense unaided by the advantages of advanced education there came the university graduate who had established himself in industry, and the three points of view were expressed with great candour. The conclusion to be drawn from the symposium is that personality and common sense are no less valuable than high academic qualification. Given an equal share of the former, the man from the university is obviously the better equipped, but experience has shown that there are many men in whom the former qualities are so exceptionally well developed that they more than compensate for the absence of degrees.

Law and the Chemical Manufacturer

THE chemical industry is probably unique among the industries of this country in regard to the number and extent of Acts of Parliament and Statutory Rules and Orders by which it is governed. Many statutes, of course, such as the Factory Acts, apply equally to other industries, but the great majority are concerned exclusively with chemicals, and we can sympathise with the legal department of the Association of British Chemical Manufacturers in having to keep in close touch with every amendment or new piece of legislation affecting the activities of its members. Six years ago the Association issued an index to the legislative enactments then in force, and each year since that time it has issued a supplement. The original index, together with the supplements and details of new developments in 1936, has now been brought up to date by the issue of a second edition, purchasable by non-members at 2s. 6d. post free. The references are indexed under no fewer than 132 main headings and a number of additions and alterations have been incorporated. References have been included to various official publications which are not statutory enactments, but which provide a useful summary or guide to official regulations or practice. On the other hand no attempt has been made to give a complete list of orders affecting what may be described as day-to-day commercial matters, such as import duties, as these change so rapidly. The index will be more useful in practice as a guide to sources of information than as a complete catalogue.

A Vital Subject

THE prevention of disease in industry is a matter of vital concern to the chemical engineer, and he will do well to ponder the fifteen points into which Dr. Donald Hunter divided the subject in his recent paper before the Institution of Chemical Engineers. Despite the many influences that are at work to bring home to the manufacturer and the user of materials involving known or unsuspected dangers to health there is still a great gulf between the mass of knowledge which the medical staff of the Factory Department has acquired and the information that is available to the individual factory owner or worker. So far as members of the Association of British Chemical Manufacturers are concerned they have the advantage of a well organised service of pamphlets and model safety regulations to educate users of poisonous materials, but there is something to be said for the plea put forward at the Institution meeting that much more should be done in the way of publishing reports of cases that have come to the notice of the Department, for the benefit of industry generally. Unlike certain aspects of chemical engineering practice in which the safeguarding of individual commercial interests sometimes creates a barrier to open discussion, industrial health is a subject that concerns everybody, and a useful purpose might be served if the Institution and some of its kindred organisations could persuade officials of the Department to meet them a little more frequently to talk over the lessons learnt from actual experience and suggest ways and means of raising the general standard of health in the factory.

Public Relations

HOW many chemical manufacturers realise that they, as well as the railways and power companies, have public relations problems to solve? In many cases the manufacturer concerns himself only with his immediate trade, but makers of commonly used poisons, explosives, disinfectants, insecticides, drugs and fertilisers cannot afford to forget their products after they have left their hands. Such products directly affect human safety, health and welfare, and the way the public uses them and its attitude towards them are of vital importance to the producers. Because of their very nature, many chemical products intended for general use have great powers for both good and evil. The average layman knows little about their properties and must be carefully educated, often to an extent that seems unreasonable to a chemist, before he is competent to handle them properly. On the other hand, if the products are improperly handled, used or compounded, injuries and even fatalities may occur. Such accidents are likely to get into the news, and even a few cases of that kind may arouse popular prejudice and provide ammunition for attack by competitors and for certain self-appointed guardians of the public welfare. For those reasons it is desirable that producers, not only through their trade associations but as individual firms, should educate users in the application of products, investigate accidents and their use and lay the true facts before the proper authorities, and generally maintain a policy of public relations.

The Chemist and His Relations with Industry

A Symposium at Manchester

THE Society of Chemical Industry held a symposium on on the subject of "The Chemist in Industry: His Induction, Functions, Influence and Rewards" at the Grand Hotel, Manchester, on April 2, at which eight outstanding members of the chemical profession and industry contributed papers on varied aspects of the subject. The meeting was divided into two sessions, one in the afternoon, at which the induction and functions of the chemist were discussed by Dr. J. J. Fox, Professor J. J. Philip, Mr. F. Scholefield, and Mr. C. M. Whittaker, and the other in the evening, when the discussion on the chemist's influence and rewards centred on papers by Dr. A. E. Dunstan, Mr. W. Ballantyne, Mr. G. E. Collins and Mr. J. Rogers. Dr. R. H. Pickard acted as rapporteur for the afternoon session, and Mr. C. J. T. Cronshaw for the evening session.

His Induction and Functions

Dr. J. J. FOX, Government Chemist, said there was an aspect of the employment of young chemists in non-teaching posts which perhaps was not so well realised, or even understood. Without criticising the tendency in the training of the modern chemist, it was the fact that numbers of honours graduates seemed to have acquired a superficial acquaintance with numerous aspects of chemistry and had no deep insight into more than one very special branch of the science. Doubtless this arose from the presumed desirability of making the student acquainted with something of the activities in as many sides as possible and the lack of time to meet increasing demands. It was a matter for consideration, however, whether it would not be better to reduce the syllabus of instruction or increase the time required so as to enable the student to obtain a thorough knowledge of fewer branches of chemistry, particularly on the practical side. In this respect it was frequently found that the graduate was without practical knowledge of matters which in the view of many was essential in a practical science.

This criticism of some tendencies in the training of young chemists must not be regarded as a criticism of the student. He (or she) was as good as ever, and a year or so of practical training brought out the essential soundness of the younger chemists when given their chance, and they could turn over to a new subject with confidence. In some degree this could, of course, be used as an argument in favour of the present training; but the object of his remarks was to put forward the view that a more thorough grasp of fewer subjects was to be preferred in those chemists who had to deal with the more practical side of the subject.

The Early Stages of Training

Professor J. C. PHILIP (Imperial College of Science and Technology) said the extensive and growing penetration of the field of industry and State service by the trained chemist suggested one or two considerations which might well be emphasised. It was not only the opportunities but the responsibilities of the chemical profession in relation to the industrial and social interests of the community which were steadily increasing, and if the best traditions of the older professions were to be equalled it was more and more necessary that chemists should maintain high standards both of technical competence and personal service. The future status of the chemical profession in the community would be determined by the extent to which its members showed themselves to be not merely technical experts but men of broad outlook and high ideals. In the early training of such men provision must be made for a sound general education aiming at the achievement of character, culture, and a broad sympathy—objects to which the premature specialisation, so common nowadays, was definitely inimical.

Whether academic folk liked it or no, chemistry was now far from being a purely philosophical discipline; so far as the service of the community was concerned it was a practical science and a large proportion of the students under training were to be practising chemists. That being so, it was undesirable that theoretical refinements and subtleties should figure so largely in the training of undergraduates that an appreciation of the broad principles of chemistry and their application was crowded out. The man who left the university with a B.Sc. or even a Ph.D. degree was far from being a mature chemist.

Although he might have a sound grasp of fundamental principles and practice, entry into the works laboratory or the factory presented him with problems and conditions of which he had had no experience. His training entered on a new stage. The graduate in chemistry may have proved himself, within the limits of university work, to be intellectually able and practically competent, but industry could best provide the conditions and the opportunities for eliciting and developing certain other highly important qualities such as personality, resourcefulness and adaptability. This, of course, was recognised by many of the firms which employed trained chemists, and the fresh university graduate was given reasonable time to settle down and prove his worth in the new environment.

Opportunities During Vacation

There were other minor ways in which industry could co-operate with university and college teachers in the training of the chemist. Take first the question of the vacation between one session and the next. While this interval may be very profitably used by a student in travelling abroad—and the college vacation provided an opportunity for this which did not often recur—there were cases where the chance of spending, say, six weeks in a works or an industrial research laboratory would be eagerly welcomed. From the point of view of the serious student the experience gained in this way was extremely valuable. On the other hand, the temporary intrusion of an inexperienced outsider into the works or the technical laboratory was, on the face of it, an unattractive proposition for those in charge. He would plead, however, that industry, taking a broad view of the position, should afford more opportunities for such vacation work.

In another way co-operation in the training of the chemist could be promoted, namely, by closer personal contact between those responsible for the earlier and later stages of this training. If works managers and directors of industrial research were to visit our departments of chemistry more frequently, and compare experiences with the responsible teachers, benefit to both parties would undoubtedly result.

Problems of the Textile Industry

Mr. F. SCHOLEFIELD (Manchester College of Technology) said the functions of the different classes of professional chemists employed in the textile industry must differ widely. On the one hand was the works chemist responsible with his assistants for testing materials, controlling processes, and for technical investigations. On the other hand was the research worker, often with five or more years of university training, attached to the research station of the industrial research association or of the large individual firm or combine. He was chosen not, as a rule, for his knowledge of and contact with the details of the technical process which his work, would ultimately affect. He might be required to work, largely on his own initiative or as a member of a team, upon some very definite physical or chemical problem, and the results of his work would probably be applied by other hands to the industrial process. For this reason, his most

valuable qualification might be his experience, acquired in the university, of the methods and outlook of those engaged in some special branch of pure research.

Advancement in these two categories took place in quite different ways. The works chemist, brought into contact usually with the whole range of operations carried out in the works, became under-manager or works manager and, in exceptional cases, general manager with perhaps a seat on the board of directors or a partnership. The research worker, on the other hand, tended to remain a research worker, and seldom changed his functions for those of industrial management. It was doubtful indeed if the research worker, often engaged upon fundamental problems, could afford to neglect to keep himself in touch with the present rapid advances in scientific thought and achievement.

Recognition of Chemical Technology

It was time that a plea was made by chemists for the recognition of chemical technology as entitled to an important place in our universities not primarily because of its value in acquainting a man with the details of a particular branch of technology, but because of its value as an intellectual training.

In a university course attendance for three years should be required between the Intermediate Science stage and the Final, partly with a view to ensuring a sufficiently broad fundamental knowledge. There should be in the first year after the Inter. B.Sc. the beginning of an elementary study of general textile technology—the properties of textile fibres, the principles of spinning, preparation, and weaving. The textile finishing industry was a machine industry, and the works chemist should be familiar with engineering drawings and elementary engineering, mechanical and electrical. Chemistry, physics, and mathematics should be further studied for two years after the Inter. B.Sc., with special emphasis on certain aspects of physical chemistry. In the final year of his course, the would-be textile chemist should be concerned mainly with textile chemistry and physics. It was not suggested that this would *teach* a man his job in industry, but it would enable him to *think* about it—the real objective.

There should be ample opportunity for the student to study and practise the application of science to the solution of technical problems. It was wrong to suppose that this technical training ought to be deferred to a post-graduate course—there was a time factor which required not merely intensity of study, but contact with technology during the greated part of the undergraduate course.

Value of Common Sense

Mr. C. M. WHITTAKER (Courtaulds, Ltd.) said in his experience there were just as many fools walking about with high academic qualifications as there were able men walking about with lesser academic qualifications, but of greater ability and deserving of greater financial reward. A rigid salary limit according to academic qualifications was, in his opinion, unfair. A chemist of high academic qualifications endowed with common sense was a pearl without price or salary limit, but a chemist with lower academic qualifications endowed with a maximum of common sense was to be preferred to a chemist with higher academic qualifications and a minimum of common sense.

It was the function of all chemists whether research or production to apply their knowledge with common sense. Common sense was inborn and could not be taught by the university or our industrial psychologists. It behoved every chemist to cultivate to the utmost the common sense with which Providence had endowed him. The chemist with the most common sense would get the best industrial positions. After 37 years in industry it was his experience that common sense was one of the scarcest commodities in the market place, and therefore those endowed with common sense must demand high remuneration.

"Yes" Men

The chemist should also be able to sense his environment, because modern industrial organisation had created environments which favoured the type known as "Yes" men. By that he meant a man who was able to guess the answer which his superior required, and gave him it whether he himself believed it or not. In other words, 90 per cent. diplomacy and 10 per cent. knowledge would win in some environments over 10 per cent. diplomacy and 90 per cent. knowledge. When a chemist found himself in such an environment whether he decided to stay in such an environment or leave it depended whether he wished to be captain of his own soul.

To the young chemist he would suggest that one of the most unpleasant facts which he would sooner or later recognise was that the commercial side of industrial organisation ran away with the best paid jobs. Commercial men were nearest to the directors. Swarms of commercial men were on boards of companies, but there were not many chemists. Dividends were paid out of profits, so that whatever else a director might neglect he did pay attention to the sales figures and so frequently knew the staff of his sales department better than his production department. A chemist might devise a process which led to increased sales and he might be specially rewarded for his work, but he would frequently find that the commission drawn by salesmen on the extra sales due to his discovery was much larger.

Avoiding a One-Track Mind

Chemists should avoid a one-track mind, but cultivate a general knowledge of affairs. It was amusing what a poor opinion some industrialists had of technical men. One industrialist said that his nomination as a member of the Dyestuffs Advisory Licensing Committee was unsuitable because that committee had questions of policy to decide. Needless to say that industrialist was abysmally ignorant of dyestuffs and their application. Finally, chemists should use the language of the Bible so that it was understood by the man in the street. They should not use "induction" when "entry" would do.

The Chemist's Influence and Rewards

Mr. HORATIO BALLANTYNE (Lever Brothers, Ltd.) said it was his firm conviction, based upon an active professional and business life of over fifty years, that the confidence with which the chemist entered upon an industrial career was amply justified. There was no occupation that offered greater opportunities, greater variety of work or greater interest. Socially, the chemist was nowadays of equal rank with his coevals in other walks of life; he no longer needed to explain himself.

If he had adopted the career from love of the work, he derived from the kaleidoscopic developments of the science an abiding satisfaction which was itself no small reward. The emoluments and positions of responsibility which fell to the chemist compared quite favourably with those enjoyed by comparable classes engaged in other technological pursuits.

For actual salary statistics, the valuable returns prepared by the Institute of Chemistry gave a fair idea of the emoluments of professionally-skilled chemists in various occupations.

He imagined that the figures rather understated the position, so far as chemists possessing that degree of competency, engaged in chemical industry, were concerned; but on the other hand, there were many outside the Institute's fold whose remuneration, it might be supposed, was on a somewhat lower scale, and the returns might therefore be accepted as affording a trustworthy picture. It was more difficult to compare the remuneration of chemists with that of non-technical men. There was here no common datum line; one was thrown back upon personal opinion and assessment of individual merit. He could not honestly say that in his ex-

perience the chemist had reason to consider himself less generously paid than his opposite number in the commercial or other non-technical groups.

The possession of chemical knowledge was no handicap, but an advantage, to the man who aspired to a position of authority in a chemical industrial concern. If he was wise, however, he would perceive that such knowledge was not by itself sufficient. The university or college could help him to a sound chemical training, but it could not teach him such qualities as initiative, imagination, sound judgment, knowledge of human nature, leadership, or that subtle quality termed personality. The business man was in no favoured position; when he came to the fore it was because he was gifted with these qualities. With a similar equipment the way to advancement was as open to the chemist as to anyone.

Useful Discoveries and Inventions

The majority of useful discoveries and inventions in the chemical industry were nowadays made by employees, or groups of employees. They arose out of the performance of the employees' duties, and were usually the property of the company or firm. If used—as they commonly were—solely in the employers' works, there was no sale or granting of licences to outsiders which might enable a monetry value to be put upon them. In such cases it was not customary for the inventors to receive remuneration specifically for the part played in making the invention. Recognition, as a rule, took the form of promotion, increase in salary, or the like—an indirect but more substantial and assured recompense than would be likely to accrue from the sale of "rights." An inventor of this class was more fortunately placed than the outside inventor, who was not intimately connected with the particular concern. The outsider, it was true, sometimes received a much higher monetary reward, but that was only if the invention was of very considerable magnitude and merit, and generally the remuneration had to be shared with others who had co-operated in its development.

Mr. G. E. COLLINS (Shirley Institute) said it might be concluded from a survey of the progress of the last thirty years that the chemist, by his works, had had a profound influence on the material and indirectly on the whole of the life of his fellow citizens, an influence that had been on the balance beneficial, but might have been much more so under a more favourable economic system definitely planned to utilise his discoveries for the general rather than a sectional interest. During recent years there had been an increase in the proportion of chemists in administrative positions. While it was undoubtedly true that other qualities were necessary for such positions it did not appear that executives trained only in administration had been able to complain that the training and outlook of the chemist had in any way proved a disadvantageous preparation for this kind of work: on the contrary, it was not unreasonable to consider that a much sounder lead in the conduct of industry could be given by directors who combined an appreciation of the developmental possibilities of the chemist's activities with administratve experience. Chemists who had to discuss matters connected with industrial production knew how much more rapidly proper conclusions could be reached with a directorate having technical training.

The Range of Remuneration

Chemists received from about £150—£200 per year upwards as remuneration for their services. The actual value of the payment showed some positive correlation with the importance of the position and the experience and ability of the chemist himself.

The causes of these correlations were economic and psychological. Besides the influence of tradition, chemists for the more responsible positions might be difficult to obtain, and the suitable chemists themselves appeared to believe, in common with many other classes of workers, that there was no limit to the reward that they should receive on account of the accident of superior brains, ability, or character. Discussions had arisen from time to time about the relative pay of the chemist and other citizens, and some chemists asserted that in virtue of his "professional" status his pay should not be less than a certain minimum; others compared him unfavourably with those who exploited his discoveries. As the fundamental assumptions from which the conclusions were reached were usually not stated, the discussion was correspondingly unprofitable.

The work of all responsible chemists was creative to a greater or lesser degree and therefore in a similar degree was its own reward. It was true that the specialisation and mchanisation of labour leading inevitably to a proportion of menial work had spread into the practice of the chemist so that in the humbler positions the creative element might be very small.

Dependence on Scientific Staff

Dr. A. E. DUNSTAN (Anglo-Iranian Oil Co., Ltd.) said it was clear in any industry depending on chemical and physical science that its very life claimed at every stage the knowledge and advice of its scientific staff. One or two examples might suffice. Consider, for example, the industry depending on the production of mineral oil from coal by means of hydrogenation. There were in three countries great industries based on this transformation. In our own country we had the development of the hydrogenation of coal and coal oils at Billingham. In Germany the I.G. had been busy for years on the same project. In the United States New Jersey was a pioneer in laying down hydrogenation plant more particularly for oils.

Such projects from their very inception to the end of the development stage were entirely dependent on the influence of the chemist, the chemical engineer, and the engineer. In other words they were completely based on scientific and technical knowledge. Their subsequent career was equally based on the application of science. Consider, further, the development of the great petroleum industry. Only a generation ago the products from petroleum were few and were just able to meet the day by day demands on them. To-day the chemist in the industry had not only multiplied the effective and possible products to an extraordinary extent, but had further developed methods of refining and treatment that made them to the fullest extent available for everyday use. One of the best examples could be seen in the motor fuel available for the automobile on the road to-day.

Inevitably, given the right man with the right training, there was no industry in which the influence of the chemist would not be felt, and furthermore, felt to a greater and greater extent. Apart altogether from the chemist as a discoverer, there was the chemist as a controller. It was obvious that in this respect alone lay an influence that could not be over-estimated. There had been in some quarters a suggestion that the analyst was a sort of maid-of-all-work in industry. This was entirely wrong because it was on the performance of accurate analysis that all industry depended, and, furthermore, the work of the research chemist in the long run was based on his colleague who was able to return accurate data on his products.

A Hard and Wearisome Affair

For the chemist brought up in good academic surroundings, who had had all the facilities to carry out his experimental work and prosecute his ideas, it might be fair to say that his reward lay therein. This was by no means the case. More and more as time went on it was found that the chemist in industry who had played his part in the development of methods and improvement of processes and products was drawn into the orbit of management. The training of the man of science was a hard and wearisome affair. If in its course he learnt nothing of men and affairs it was unfortunate. But general experience had shown that the technically trained man who had been continually brought up against hard facts (which were harder than hard people) could inevitably make good in management and in affairs.

Mr. JOHN ROGERS (Imperial Chemical Industries, Ltd.), said it must be realised that chemistry was the servant of industry, not its master. A good deal of harm had been done in loose talk about the status of the chemist, the general feeling being that he should have some special status above that of other people and that he should have this even when he went into industrial life. Most men who took up chemistry did so with the desire to "get on in the world." They did not take it up to advance knowledge: some, of course, did this incidentally, or even accidentally, but the desire of at least 90 per cent. of the students was to get on—to get a job, to become an industrialist. In industry and commerce the largest awards under to-day's conditions went to those who made use of discoveries, not to those who made the discoveries.

Personality Counts

Those in control of industry, when choosing young men, seldom restricted themselves exactly to the qualifications which the immediate post to be filled demanded or, at any rate, they should not do so. They said to themselves: "Now here is a post to be filled; what sort of man do I want?" They knew what the requirements were, but as a rule they looked beyond those. Personality, that indefinable something, was generally important.

In his opinion the chemist starting his career in a job which was not 100 per cent. chemical should not be too keen on getting himself labelled "a chemist." Professors of chemistry should discourage this tendency, for the trouble in industry to-day was that those in authority were inclined to consider the novitiate simply as a chemist and leave it at that.

Chemistry was in some of its aspects an exact science; therefore the chemist ought to know what exactitude meant. If he fathered an ill-thought-out scheme he was certain to damn his own reputation, and his employers would naturally take some persuasion before they would listen to him again. Furthermore, he must cultivate the art of interpretation, for he must frequently deal with people who had little or no knowledge of chemistry. They could not understand his language, and it was therefore his duty to make himself understood, even for his own ultimate benefit. Chemists had been known to remark about their directors, "What do they know?" Very possibly nothing, but the truth was not always palatable. He had known chemists also who failed to remember that time was an element in any scheme. It was therefore just as well to inform the principals when a scheme was likely to fructify if a certain sum of money was spent on experiment or research, for there was always the possibility that if the scheme was to take years, those principals might have a more remunerative outlet for their money.

Nowadays the line of demarcation between technical and commercial people was very wavy indeed. Formerly it was clear and straight; one was a chemist and that was the end of it. In Imperial Chemical Industries the line was very wavy and was becoming more so every day. The chairmen of the groups—which were in themselves very large companies—were drawn from all the professions. Some were engineers, some chemists, and some commercial, but all had been chosen, not on account of their technical or commercial abilities, but because they were the best available men for the job.

Scope for Advancement

It was true that in large businesses it sometimes appeared to the younger chemist that there was little scope for advancement and that he would get on better in a smaller concern. This was perfectly true, but in the bigger concerns the plums were larger and riper, but naturally there was more competition for them. But, judging from his own experience, it was not the case that the merits of the younger men were overlooked. Indeed, no company could ever succeed if it adopted that principle. One of the most difficult problems in industry to-day was to get a proper measuring stick with which to decide the reward for the man who was not fitted to become an administrator, a director, or a general manager, but who was a good research man. Without research men industry could not progress, and they ought to be rewarded properly. A research man must be an optimist; it was, indeed, impossible to conceive one as a pessimist, but it was a good thing for the optimist to confer with a pessimist when he became over-enthusiastic.

In a chemical factory recruits to the manufacturing departments were generally selected from the laboratory staff, and great care should be taken when such appointments were made, for some chemists, through temperament, or for other reasons, could never be fitted into manufacture or administration. Their place was the laboratory, and, fortunately for industry, there were a good many such.

Letter to the Editor

Chemistry—Whither ?

SIR,—Dr. F. Sherwood Taylor's article in your issue of March 27 contains much that is interesting. The mechanism of catalysis in simpler reactions is certainly better understood than was the case a decade or so ago; and in most instances we are at least able to say on general principles whether or not a given substance is likely to catalyse a given reaction. However, as Dr. Taylor has very rightly stressed, ordinary catalysts are almost exclusively bodies of simple chemical structure, and little has been done towards the artificial synthesis of the more complicated organic catalysts which are responsible for the smooth low-temperature synthesis of organic products in vivo. While research in this direction is undoubtedly desirable, if only as a means of enlarging the scope of products which can be made by catalytic means, the practical application of any synthetic organic catalysts of enzyme type that may eventually be abe to be made artificially by necessarily difficult and complicated preparative processes is problematic. Complex bodies of this type, even if once made, are themselves very liable to chemical change; and the initial presence in a potential reacting system of a small quantity of such a catalyst, would by no means lead necessarily to the production of a relatively large quantity of reaction product. The simpler inorganic catalysts are at least stable and can be prepared and revivified relatively easily.—Yours faithfully,

E. B. MAXTED.

The University,
Woodland Road, Bristol.

Imperial Chemical Industries

8 per cent. Dividend Maintained

THE directors of Imperial Chemical Industries, Ltd., announce that the net income for the year 1936, after providing £1,000,000 for central obsolescence and depreciation fund and £846,093 for the company's income tax, amounts to £7,203,329 as against £6,706,539 for 1935, or an increase of 496,790. With the balance brought forward from 1935 of £638,740, the total balance is £7,842,069. After providing £1,591,014 for the dividend on the preference stock and £1,229,973 equivalent to 2½ per cent. interim dividend on the ordinary stock, the directors have appropriated £1,500,000 to general reserve and £150,000 for the workers' pension fund.

The directors have decided to recommend a final dividend on the £49,198,900 ordinary stock of 5½ per cent. actual making 8 per cent. for the year, less income tax at the standard rate for 1937/38 (reduced by relief in respect of Dominion income tax at the rate of 3½d. in the £). These dividends will absorb a total of £5,526,927 and leave a balance of £665,142 to be carried forward to 1937.

The final dividend on the ordinary stock will be payable on June 1 to the stockholders on the register of members on April 17. The annual meeting will be held on April 29, at 11 a.m. at the Queen's Hall, Langham Place.

Synthetic Resin as a Material for Chemical Plant

Some Notes on Progress Abroad

IN the past few years this country has made so much progress in the evolution and development of chemical plant made of synthetic resin that we are apt to lose sight of what is happening abroad. Both in Great Britain and elsewhere the resin universally acknowledged as the most suitable for use in the construction of chemical plant is the phenol-formaldehyde type. It is selected because it has great mechanical strength, good physical properties, a high resistance to corrosion, and is an efficient binder for the incorporated asbestos. The material of this nature most widely manufactured abroad

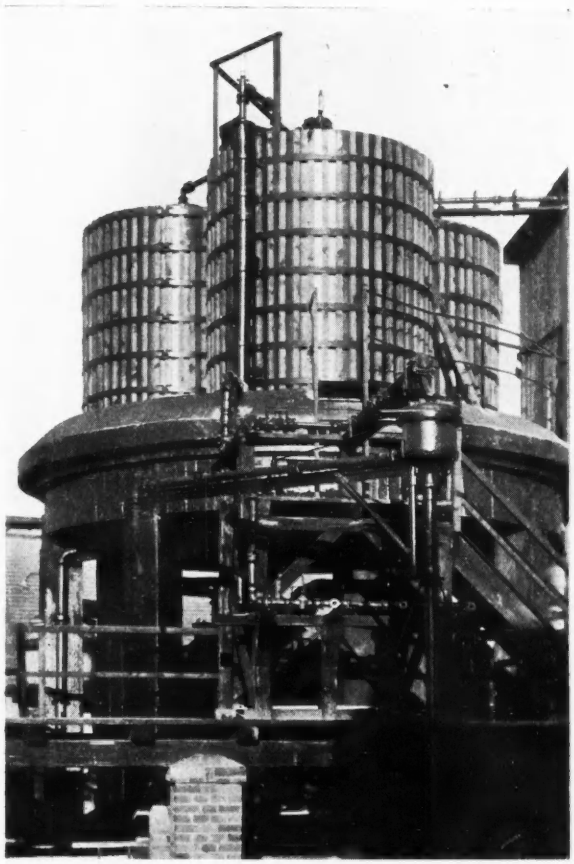

Fig. 1. Storage plant of 50 tons capacity for hydrochloric acid, consisting of three vessels, each manufactured in one seamless piece.

bears the name "Haveg," and is made in Germany by the Säureschutz Gesellschaft m.b.H., and in the United States by the Haveg Corporation.

There is practically no limit to the size of plant which can now be made from this material; cylindrical tanks over nine feet diameter and of similar height can be made seamless in one piece. By combining such units plant of any desired dimensions can be made, and as Haveg is only one-fifth the weight of iron transport and erection is easier. Fig. 1 shows a storage plant of 50 tons capacity for hydrochloric acid, consisting of three vessels, each manufactured in one seamless piece; the tanks are protected from mechanical injury by upright wooden strips held in position by steel bands. In the dyeing industry the synthetic resin material has become popular for the construction of dyeing vats and other equipment, because of the ease of cleaning, smoothness of surface and durability. There is no absorption of dye to injure succeeding fabrics, and it is therefore possible to change over quickly to different colours. Practical tests in textile factories have shown that a saving of 75 per cent. in the steam consumption of dyeing machines is effected through the low heat-conductivity of the material.

Filter-press plates and frames of practically any size may be constructed (Fig. 2); these are not only resistant to the

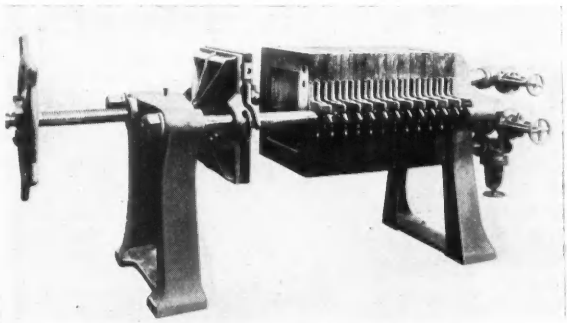

Fig. 2. Filter press plates and frames.

liquids filtered, but give no contamination. Being light in weight the plates are easily moved when closing or opening the press for cleaning, and may be thoroughly cleansed by washing with a hose. Warping or swelling does not occur as it sometimes does with iron plates, so that leakage between the plates is avoided. Where high pressures and severe mechanical stresses are encountered Haveg may be reinforced with steel. Large rectangular tanks are provided with a skeleton of steel ribs on the outside to prevent bulging; cylindrical pressure vessels may have steel ribs or an external sheet of steel, depending on the working pressure required.

In the construction of pumps, both plunger and centrifugal pattern, synthetic resin materials have been found very suitable as they have a high resistance to shock, vibrations and similar stresses. Fig. 3 shows a direct-coupled centrifugal pump in which all parts in contact with the liquor are made of Haveg; the impellers are much lighter in weight than the

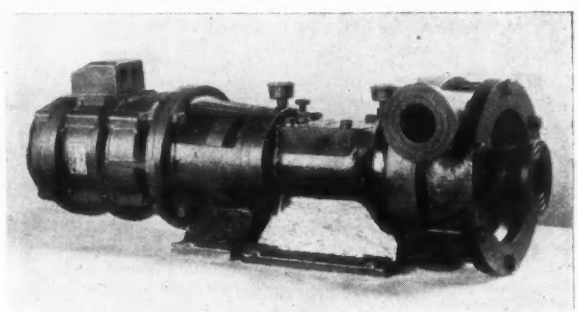

Fig. 3. Direct coupled centrifugal pump in which all parts in contact with liquor are made of Haveg.

usual metal impellers, so they can be run at higher speeds with a consequent larger output. Piping is normally made in lengths of 9 ft., with a diameter from 1 to 10 inches. Several methods of connecting such pipes are in use. For pipes exposed to acid both internally and externally a threaded joint is used. These pipes are made for pressures up to 75 lb. per sq. in. at normal temperatures, but where higher pressures are necessary the pipes may be reinforced externally. Synthetic resin material is conspicuously resistant to hydrochloric acid, and in the Bergius process for the production of glucose from wood, pressure vessels made of this material have been successfully used for several years.

In the construction of chemical plant which cannot be completed in a single moulded piece special types of cement have been developed for the efficient joining together of the separate pieces.

Such a cement is Havegit, which is a cold-setting acid-proof compound having a synthetic resin base. These synthetic cements are generally acknowledged to be an improvement on the usual cements for setting tile or brick linings in acid tanks, towers, channels, etc. They are supplied in the form of a paste which is quite stable over long periods if kept in air-tight containers. Before using, the cement paste is mixed with alcohol and sulphuric acid. Some surfaces to which the cement may be applied, such as iron, concrete, mortar, etc., require a preliminary coating of synthetic resin varnish to prevent chemical action taking place between the sulphuric acid in the cement and the basic surface.

Prevention of Disease in Industry

The Important Part Played by the Chemical Engineer

INDUSTRIAL medicine is the practice of medical supervision, preventive medicine and public health within the confines of an industry, said Dr. Donald Hunter, M.D., F.R.C.P., in a paper read at a meeting of the Institution of Chemical Engineers held in London, on March 24, when Dr. W. Cullen, president of the Institution, presided. Its aim is to safeguard the health of the employee and to minimise time lost from work because of sickness or of accidents. Though one of its functions is treatment it is mainly an advisory and preventive service. The industrial medical officer has to co-operate with managers, workers, engineers, chemists and architects. He has to discover faults in the working environment and try to find remedies. One of his most interesting duties is to bring into the effective service of industry the discoveries of the research worker.

The Factory Department of the Home Office is engaged constantly in effective and progressive work for the prevention of disease in industry. It numbers on its staff men and women who are among the greatest living authorities on different aspects of industrial hygiene and toxicology. Their profound store of knowledge, constant helpfulness and unfailing courtesy industry sometimes fails to appreciate to the full. It is important that doctors should have the special knowledge and training which enables them to offer advice to the employer as to how his indusutry may be carried out in safety. At present, with a few exceptions, it is only the medical inspectors of factories who have this knowledge. No doubt with the growth of this branch of preventive medicine more doctors will make themselves competent in this interesting work.

Protection of the Workmen By Law

In this country the number of diseases notifiable under the Factory and Workshops Acts and subject to compensation under the Workmen's Compensation Acts indicates the existence of an alert and enlightened legislature. From 1878 onwards, provisions were made to control dangerous trades by so-called special rules of the Home Office. The early knowledge of industrial diseases was obtained by placing an obligation on the medical practitioner and employer to notify them to the Chief Inspector of Factories. Between 1896 and 1927, anthrax, toxic jaundice, epitheliomatous ulceration, chrome ulceration, chronic benzene poisoning, and poisoning by lead, phosphorus, arsenic, mercury, carbon bisulphide, and aniline were made notifiable. The scope of the Workmen's Compensation Acts is wider than that of the Factory Acts, as they are intended to cover all cases of sickness of strictly occupational origin, the individual being considered and not merely the conditions under which he works. There are now some thirty-eight scheduled diseases, and of these the diseases of miners and dermatitis alone constitute more than 90 per cent. of the cases compensated. New occupational risks constantly arise; asbestosis and dioxan poisoning can be quoted as dangers recently brought under control. Sometimes great expansion will occur in one trade, as was the case with the manufacture of accumulators from 1922 to 1924 owing to an increase in the use of motor cars and wireless apparatus.

In this country medical examination of entrants into industry, required by law and carried out by certifying surgeons, is very limited in extent and applies only to young persons between the ages of 14 and 16; but it was undoubtedly the forerunner of the much more extensive voluntary medical examination now frequently undertaken. An increasing number of employers are realising the advantages of some kind of medical service in the factory. An additional measure of protection applied in many industries is the periodic medical examination of any workers exposed to known risks. This may be at weekly, fortnightly, monthly, or quarterly intervals and may be carried out by the certifying surgeon or an appointed surgeon approved by the Chief Inspector. These examinations are chiefly undertaken in the case of work involving exposure to lead, to carbon bisulphide, to benzene and other fumes in india rubber works, and to chromic acid in chromium plating.

After the war, a number of medical men were appointed to work as whole or part-time works doctors with happy results, but there is a need for the employment of a still greater number. They can often detect intoxication before disability is produced. Thus, examination of the blood for punctate basophilia is of extreme value in the prophylaxis of plumbism and is indeed essential if the occurrence of manifest plumbism is to be avoided. Similarly in the earliest stages of benzene poisoning the platelet count and white cell count may fail and before tetrachlorethane poisoning appears elevation of the white cell count may be found. Facilities should be available for periodic medical examination and for repeated radiograms of the lungs in persons exposed to the risk of pneumonokoniosis.

Prevention of Dust and Fume

Dangers from dust and fume may be removed by the application of local or general exhaust ventilation. As Sir Thomas Legge emphasised "unless and until the employer has done everything—and everything means a good deal—the workman can do nothing to protect himself, although he is naturally willing enough to do his share." Wherever possible exhaust ventilation through hoods must be applied at the point of origin of the dust or fume. It is in use in the manufacture of electric accumulators and of white lead (Fig. 1), in the manipulation of silica and asbestos, and of carbon bisulphide and benzene in indiarubber works. In certain instances general as opposed to local exhaust ventilation is applied. Good examples of this are the ventilation of dope rooms and of cellulose spraying shops, where it is obviously impracticable to apply local exhausts directly to each doping bench or spraying horse. In dusty lead processes, such as mixing and pasting in the manufacture of electric accumulators, and the breaking down of the white lead stack, the hose pipe must be used freely to reduce dust to a minimum. The breaking down of white lead stacks in a dry state must be forbidden, and white lead should be converted direct into an

oily pulp without dry grinding. The use of dry sandpaper for the removal of paint must be forbidden, and wet waterproofed sandpaper must be substituted. A preventive method which has been widely applied in the mining, metallurgical, and ceramic industries, is the substitution of wet methods for the original dry screening, grinding, milling and mining processes.

Protective Apparatus Uncontrollable by the Workman

Sir Thomas Legge used to emphasise that in the prevention of disease in industry, "if you can bring an influence to bear external to the workman—that is one over which he can exercise no control—you will be successful; and if you cannot or do not, you will never be wholly successful." In the case of exhaust ventilation it is usually a simple matter to have the machinery operating the fans outside the workshop altogether. Even so, the protective apparatus may not be fool-proof, as in the case of the workman in a grinding shop who can turn back the hood from his grinding wheel for use as a receptacle for tools, making the apparatus ineffective.

Education of Workman as to Nature of Danger

Sir Thomas Legge used to insist that "all workmen should be told something of the danger of the material with which they come into contact, and not be left to find it out for themselves, sometimes at the cost of their lives." The factory physician should insist on the necessity of teaching the workman to take an interest in protecting himself. He should be taught the importance of clean habits in lead works, and should be made to understand such things as the principles of dust suppression. For example, he should know that a vacuum cleaner is used to remove dust from a workshop for his protection, and should, therefore, never be employed with the motor reversed.

Cautionary placards and illustrated notices should be used in the work-rooms concerned so that the early lesions of the skin in anthrax and in chrome ulceration are familiar to all. To ensure the prompt treatment of anthrax, an individual card has been devised for workers employed in industries exposing them to risk. In case of illness this is presented to the doctor as a hint that the possibility of anthrax should be considered. It is of vital importance to train men in safe methods of artificial respiration so that these can be employed promptly in cases of carbon monoxide poisoning. The factory physician must never agree to a scheme where the workmen are kept ignorant of the poisonous nature of substances handled. In the war American workmen were told that trinitrotoluene might indeed explode but was otherwise harmless. This attitude was a distressing obstacle to those who tried to introduce into American plants the safeguards which had been successfully adopted in this country.

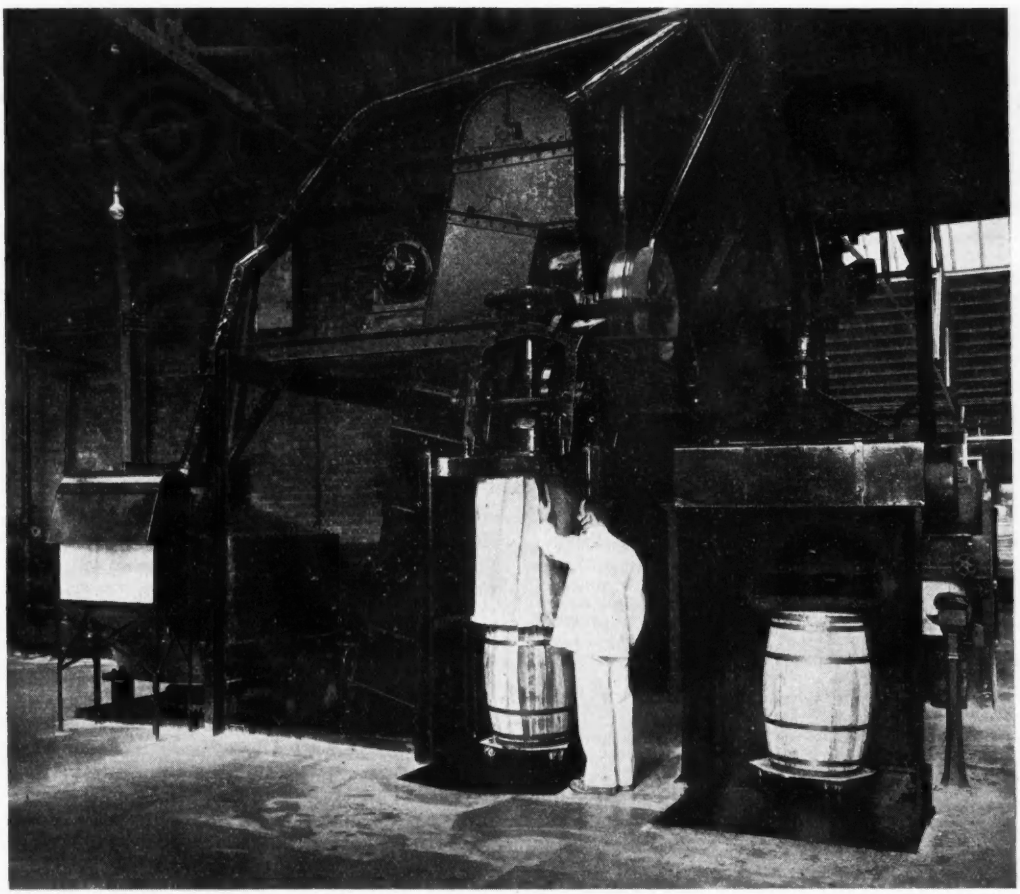

Fig. 1. Packing plant for dry white lead. On the left is a completely enclosed grinding mill, electrically illuminated from within. On the right are steel packing chambers used for heading up casks. Clean air flows past the operator in the hood above the casks. The hood is connected to the system for exhaust ventilation. Note that the floor is kept wet.

Cleanliness of Work Places

In some dangerous trades constant vigilance by a staff of good foremen is necessary. In the manufacture of trinitrotoluene absorption through the skin cannot be prevented unless benches, tools, floors and walls are kept spotlessly clean. Similarly, glaze rooms and dipping rooms in the potteries, accumulator pasting shops, and all rooms in which a dusty lead process is carried on must be wet cleaned every night to prevent the inhalation of dust of compounds of lead. Where it is impracticable to use a wet process, as for example in

the manufacture of litharge, the foremen must see that no dust is raised in shovelling.

Cloakrooms, washing rooms, mess rooms, baths, nail-brushes, towels and soap must be provided by the employers and used in their time. Where absorption is known to occur through the skin, as in the use of aniline, nitrobenzene, and trinitrotoluene, appropriate protective clothing must be worn. If direct contact with the poison cannot be avoided every means must be adopted to protect the skin. The surface which is necessarily exposed may be covered with a bland ointment, dusted with powder or washed frequently. There is a risk in too much washing of the skin, and care must be taken in such cases to use the least irritating cleansers, to avoid scrubbing and to replace the lost oils of the skin by inunction with an animal fat.

General Hygiene

There are certain principles which apply to all trades but are of greater importance in the dangerous trades because to neglect them may increase the susceptibility of the worker to the poisons concerned. Measures must be taken to prevent long hours of work, the employment of boys and girls, undue heat

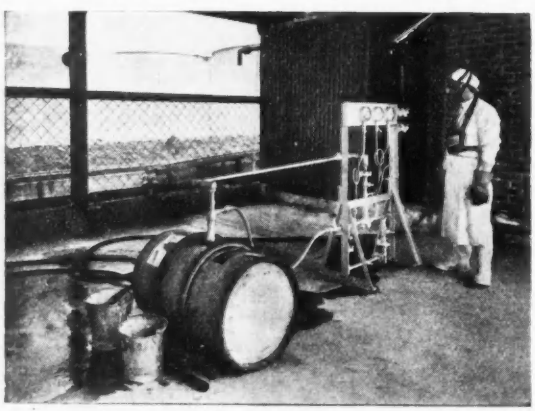

Fig. 2. Protection from lead tetra-ethyl by rubber overalls, gloves, boots, and a gas mask. The photograph shows the eductor used to govern the proportion of the lead compound in the petrol mixture. (1 in 1400). Unlike inorganic compounds of lead, tetra-ethyl lead is absorbed through the skin.

from furnaces and steam from tanks, and the use of underground workshops and bad lighting and ventilation. In this country the law requires that every factory or workshop shall be kept clean and free from effluvia, provided with sufficient means of ventilation, and kept at a reasonable temperature. It does not, however, contain any provisions as regards lighting. If domestic conditions were always of the standard required by law for a factory or workshop, the health of the general population would certainly be improved. It is not suggested that the conditions existing in every factory or workshop in this country are by any means perfect, but in the majority a good standard has been attained.

Improvements by Chemists

The simplest method of preventing an industrial disease is to prohibit the use of the toxic substance which causes it. The possibility of such prohibition depends on the finding of an innocuous substance competent to replace the noxious one. In the case of yellow phosphorus, workers in the match industry were completely protected by the introduction of a harmless substitute in phosphorus sesquisulphide. The substitution of silver salts for mercury for the silvering of mirrors provides another example of the introduction of a harmless substance in place of a harmful one

Chemists have produced a low solubility glaze which protects the potter from the dust of white lead, and in a similar way paint technologists have protected the painter of metals by the invention of a non-setting red lead. The use of plastic rubber, that is rubber in which litharge has been incorporated in a mother batch to the extent of 90 per cent., will abolish the production of lead dust in certain processes in the rubber industry. Extraction with sulphuric acid or oxidation will reduce or completely remove the carcinogenic activity of a mineral oil such as that used in cotton mule spinning. Substitutes must be found for toxic solvents. Since coal tar benzene is a highly toxic substance, the works chemist must choose less toxic solvents, for example, petroleum benzine, naphtha, and acetone. Further work is required to find, for example, a harmless substitute for nitrate of mercury in the felting of fur.

Improvements by Engineers

Wherever possible mechanical means should be substituted for hand carriage. Examples of this are seen in the use of cranes, rails, hoists, travelling belts, covered conveyors and hoppers, and automatic packing machinery. The abolition of hand filling of shells, the substitution of shot-blasting for sand-blasting and of stainless steel for chromium plating, and the use of a closed-in film steam evaporator in the manufacture of silver nitrate are further examples. The invention of electro-plating about 1840 led to a great diminution in the number of cases of mercury poisoning because it replaced water-gilding, in which mercury was volatilised from an amalgam by heat over a fire.

An outstanding contribution to the reduction of the risk of lead poisoning was the invention of the wet pulping method in the manufacture of white lead. Fifty per cent. of the white lead manufactured in this country is never handled in the dry state but is converted from an aqueous pulp to an oily paste in closed-in machines. Glass workers' cataract has been minimised by the invention of a glass bottle making machine producing bottles at the rate of 40 a minute and at one-ninth the original labour cost. In iron and steel rolling mills the use of goggles made of Crookes' glass protects the eyes from the fierce heat and glare and so prevents cataract.

Where it is known by what route—respiratory, alimentary or cutaneous—a poison is absorbed the physician can, in consultation with the employer, indicate on what principles the methods of protection should be based. In the majority of industries absorption through the respiratory tract is of overwhelming importance. Except very rarely lead poisoning is not due to eating with unwashed hands. In a few industries absorption through the skin takes place, for example, in the handling of aniline, nitrobenzene, trinitrotoluene, nicotine and lead tetra-ethyl (Fig. 2). The mechanical details which render the workers in a given industry safe from toxic substances must be settled in consultation with engineers.

Multiplicity of Poisons in a Given Trade

A given trade may be dangerous for more than one reason. For example, in the painter's trade lead, turpentine, benzene and methyl alcohol may all be used, and in the rubber trade benzene, lead and carbon bisulphide. In the leather trade there may be exposure to anthrax bacilli and to carbon dioxide, sulphuretted hydrogen, nitrobenzene, and aniline. A workman may be ignorant of the substances used, or they may be trade secrets. In taking a clinical history, even when the substances are known, it is often difficult to determine which is responsible. The doctor must discover the particular department in which a man works. For example, in the rubber trade where plastic rubber is not used, there is a risk of lead poisoning, but it only occurs in the mixing room where oxides of lead are handled. In complicated processes such as those of dye manufacture, many difficulties may be encountered in an attempt to determine which chemical compound is the responsible agent. Such is the case with the so-called aniline tumours of the bladder.

Limitation of Exposure

In certain dangerous processes it must be forbidden for men to stay for long periods at any one job. In lead smelting and in processes involving exposure to carbon bisulphide,

nitrobenzene, and trinitrotoluene, short shifts must be enforced. Hours of work must be limited for men working in compressed air or in hot deep mines. The factory physician must make use of all known methods to detect the earliest onset of poisoning by substances such as lead, benzene, and tetrachlorethane.

Selection of Immune Persons

Employment of women and of all persons under 18 in certain lead trades must be forbidden. In gasworks and on blast-furnaces, where there is a danger of carbon monoxide poisoning, it is better to employ middle-aged men, who are partially protected by their lesser physical activity and slower respiration. The selection and employment of immune persons only is an ideal the attainment of which must wait on better knowledge. If research could produce satisfactory tests for immunity to various poisons a great deal of suffering and expense could automatically be abolished.

It would be idle to suppose that our knowledge of industrial diseases is a finished chapter. Many diseases of occupational origin remain unknown for years, notable instances being asbestosis and Weil's disease. Clearly there must be others still eluding our search. New processes are constantly springing up. In some countries new solvents for quick drying paints and varnishes have been allowed to poison men whereas they should have been first tested on experimental animals. A new method of tin refining recently produced outbreaks of arseniuretted hydrogen poisoning in circumstances which should have been condemned beforehand by chemists, since it is known that the action of water on metallic arsenides is to set free this deadly gas.

Further Researches

Until 1933 the co-operation of geologists in attacking the problem of pnuemonokoniosis had not been sought. The petrological microscope rapidly incriminated silicates such as sericite and sillimanite, whereas previously silica had been held solely responsible. Recently fluorosis of bones, a new horror of industrial medicine, was unearthed. Is this condition widespread among cryolite crushers elsewhere than in Denmark? Do bath enamellers suffer from it? What, if any, will be the ultimate consequences to bone and bone marrow of the deposition of calcium fluoride in the skeleton? Is the high incidence of malignant disease of the nasal sinuses in workers in nickel related to substances used in their work and is there also a high incidence of lung carcinoma among them? Will the chemist find a suitable substitute for nitrate of mercury in the felting of fur? Will the bacteriologist succeed in producing effective inoculation against Weil's disease? What is to be done about Raynaud's phenomenon produced by the use of vibrating tools, including pneumatic drills, rams, chisels and riveting machines? Will the phenomenon, hitherto confined to women, become equally common in men? These and many other problems await solution. We are on the right path but we have a long way to go.

Chemical Notes from Foreign Sources

Japan

PRODUCTION OF SILVER NITRATE, potassium bromide and gelatine is to be undertaken by the Fuji Photofilm Company.

Norway

AN ABSORPTION PLANT FOR SULPHUR is a feature of large-scale extensions to the Falconbridge Nikkelverk at Kristiansand, costing one million kroner.

Belgium

A LARGER COTTON-SEED OIL FACTORY is to be built at Elisabethville in the Belgian Congo, to replace the one recently destroyed by fire. The annual consumption of seed at the new works will be 10,000 tons.

India

THE JUBBULPORE CHEMICAL CO., LTD., authorised capital 700,000 rupees, has been registered in the Central Provinces. Its first concern will be the erection of a plant at Slemanabad for sulphuric acid. The company has mining rights on copper and bauxite deposits in the Jubbulpore district.

Denmark

A FACTORY FOR THE ELECTROLYTIC PRODUCTION of sodium and potassium hydroxides, hydrogen, chlorine and sodium hypochlorite is now being built by the Dansk Sojakagefabrik A/S. This concern will utilise the sodium hydroxide and hydrogen in its own oil-refining or fat-hardening plants, and potassium hydroxide will be sold to Danish soap manufacture.

Italy

A NEW ALUMINIUM FACTORY HAS BEEN COMPLETED at Bozen by the Industria Nazionale Alluminio, a subsidiary of the Montecatini concern. Bauxite, as raw material, will be supplied by the factory at Porto Marghero.

MOTOR TYRES ARE BEING PRODUCED FROM SYNTHETIC RUBBER, which is claimed to be giving superior results to those obtained with natural rubber. Ethyl alcohol is the raw material used for Italian synthetic rubber, 1 kg. of rubber requiring 2½ to 3 kg. of alcohol. Experiments are in progress with a view to producing alcohol from rice waste.

Holland

A CHEMICAL WORKS OF CONSIDERABLE SIZE is to be built at Herten, near Roermond, by the Nederlandsche Patent-and Kristal-Sodafabrik v.d. Dury and Hammes.

Switzerland

THE TRANS-CHEMIE A.G. FUR CHEMISCHE-TECHNISCHE UNTERNEHMUNGEN has been registered in Zurich with a capital of 500,000 francs, and will engage in the production and marketing of chemical products.

Russia

PLASTIC MASSES TO THE VALUE OF 378 MILLION ROUBLES were produced in the past year by the Trust for Plastic Masses. It is now intended to concentrate upon the production of plastic materials for the machinery, motor car, and tractor industry.

Jugoslavia

THE FIRST ROCK SALT DEPOSITS in Jugoslavia have been found in Siminhan, Bosnia, by the State drilling monopoly. They lie 300-400 metres deep, and vary in thickness from 70 to 90 metres.

Manchukuo

ESTABLISHMENT OF A CELLULOSE RESEARCH INSTITUTE has been decided upon by the South Manchurian Railway Co., at an initial cost of 200,000 yen. The new institute will devote particular attention to the utilisation of soya bean husks and kaoliang straw.

Roumania

ANILINE DYES ARE TO BE MANUFACTURED in Codlen in an old mill which is being reconstructed.

CZECHOSLOVAKIAN CHEMICAL INTERESTS have floated the "Planta" Company in Bucharest for the cultivation of soya beans.

A CONSIDERABLE INCREASE IN SOYA BEAN CULTIVATION is reported, an area of 48,000 hectares being utilised in the past year as compared with 20,000 in 1935, and only 4,000 in the years 1931-35.

Sodium Metaphosphate

Advantages for Mechanical Dishwashing

ACCORDING to a recently completed investigation of Mellon Institute, the utilisation of sodium metaphosphate represents an important contribution to both æsthetic and sanitational progress in machine dishwashing. The results of a bacteriologic study of dishes washed in restaurants under routine operating conditions indicate the superior sanitary quality of dishes cleaned with an alkaline detergent containing sodium metaphosphate. This superiority is not attributable to the germicidal action of sodium metaphosphate, but to its specific function in preventing the deposition of films of insoluble alkaline-earth salts and soaps. Film formation in dishwashing is a source of great concern to health and restaurant officials because such films form an ideal environment for bacterial growth. The utilisation of the film-preventive function of sodium metaphosphate constitutes a novel and significant improvement in dishwashing sanitation. Copies of the research report are available from Mellon Institute, Pittsburgh, Pa.

Mineral Production in Canada

Record Figures in 1936

INCREASES in the output of many mineral products and improved prices for several metals resulted in the establishment of 1936 as the record year in the mineral production of Canada.

A record nickel production totalled 167,713,000 lb. valued at $43,471,000, an increase of 21 per cent. in quantity and 23 per cent. in value. During the year a quantity of nickel-copper ore was shipped by the British Columbia Nickel Mines, Ltd., to Japan. Copper production at 414,137,000 lb. was some five million pounds less than in 1935, but the value rose to $38,665,000 from $32,312,000. Lead production constituted a record at 377,965,000 lb., a 9 per cent. increase over 1935.

Zinc production was 326,916,000 lb., value at $10,765,000 as against 320,650,000 at $8,937,000 in 1935, an increase of two per cent. in quantity and eight per cent. in value. Silver production reached 18,089,000 fine ounces, an increase of nine per cent. Platinum metals output at $7,741,000 was an all-time record.

Asbestos production totalled 307,596 tons, valued at $10,131,000 and marked an increase of 46 per cent. in quantity and 44 per cent. in value over 1935. Salt production, including salt in brine used for chemical purposes, totalled 384,149 tons, a new peak, and greater than that of 1935 by 7 per cent. Gypsum production totalled 788,287 tons, an increase of 46 per cent. over 1935.

Magnesium Oxychloride Cement

Addition of Copper Powder

MAGNESIUM oxychloride cements were first described by Sorel, in 1876, and they have since been the subject of much research because they possess a unique combination of properties. Their limitations include their solubility, the excessive volume changes sometimes encountered, and efflorescence and incompatibility with portland cement compositions or other materials that contain lime. Recent research ("Ind. Ing. Chem.," February, 1937) has disclosed that the addition of copper powder to magnesium oxychloride cements in the form of extremely fine dendritic particles results in an improvement that is directly proportional to the amount added, up to 10 or 11 per cent. While these changes may be considered as an improvement in the original composition, the effect of the addition is more accurately described as the creation of a new element whose physical properties embrace all of the good but none of the bad characteristics of magnesium oxychloride cement. The cement so produced is highly insoluble in water and free from excessive expansion even when placed in contact with materials that contain lime or when magnesium oxides are used that would otherwise have caused disastrous increases in volume; it is almost entirely free from efflorescence, and has a strength from twice to three times that of the original cement.

Modern Press Tendencies

Sir Ernest Benn and the Meaning of Freedom

THE announcement was made at the May Fair Hotel, London, on Thursday that a sum approaching £10,000 had been subscribed in response to the 1937 appeal for the Newspaper Press Fund. The appeal was made on this occasion by Sir Ernest Benn, who presided over the festival dinner.

In proposing the toast of the evening, Sir Ernest Benn reviewed newspaper Press tendencies during nearly half-a-century from his personal experience. He remarked that there had been a great transformation since the latter days of Queen Victoria. When he first came in touch with the Press it was in the hands of such editorial giants as Buckle, Le Sage, Mudford, E. T. Cook, Massingham, C. P. Scott, Edward Russell, and W. T. Stead. At that time editorial prestige had been raised to the highest level in the history of the profession, but the Press had then, as now, a business side as well, and advertising occupied a very different position. Advertising was very definitely not respectable; it was commonly understood to be one of the agencies for fulfilling the Scriptures, and parting the fool and his money.

By contrast to-day, advertising had become a vital part of the economic structure, and it was almost impossible to get an advertisement printed that would not pass the severe tests set up by such bodies as the Advertising Association. But while this had been going on, it sometimes seemed to him that, in accordance with that most inconvenient arrangement for which Isaac Newton had the credit whereby every action had an equal and opposite reaction, the business of attracting the fool's money had, in some cases at least, passed into the care of the editorial department.

The spectacular rise of the Press as a great industry had produced other effects which were worth noting. Fifty years ago we had our politicians and our Press, the third and fourth estates of the realm. The statesmen and politicians then, as now, were obliged to attune their words and actions to what the common people thought. But half-a-century ago that danger was off-set by the existence of other agencies, chief among them the Press, hard at work to teach the people to think well. Thus we enjoyed the blessings of democracy with adequate safeguards against abuse. A very different position was to be noticed to-day, when the energies of both the third and fourth estates were largely occupied in popularity hunting. The statesmen and politicians, as always, were in search of votes, and the fourth estate, in these latter years at least, was definitely in search of sales or circulation. In this way an old balance had been upset, and the safety of democracy to that extent came into question. The last half-century might be said to have witnessed a continuous struggle between the great traditions of journalism and the scientific wonders of mechanical reproduction.

Notwithstanding obvious and minor blemishes, modern journalism had an enormous balance to its credit. It was responsible for 95 per cent. of all the conversation of all the people. The spectacular rise in the standard of living of the past half-century must be attributed in part to the work of the Press, for knowledge was the basis of any advance, and it was the Press which supplied that knowledge. It could be stated with confidence to-day that no money would buy a line of editorial, and that we had the most independent Press in the world. But independence and freedrom were terms of wider significance than was sometimes appreciated. The free Press must not only be free from the interference of Government, but must also be free from the pressure of mass opinion or mass ignorance. Freedom to be all alike was no freedom at all.

Personal Notes

MR. J. DAVIDSON PRATT, general manager and secretary of the Association of British Chemical Manufacturers, and secretary of the Association of Tar Distillers, has been appointed chairman of the British Road Tar Association in succession to Sir Reginald Clarry, M.P., who is retiring after several years' service. Mr. Pratt takes over his new duties on June 1.

Mr. J. Davidson Pratt.

MR. JAMES WATSON, who for nearly 60 years was associated with Ogston and Tennant, Ltd., soap manufacturers, Aberdeen and Renfrew, died at Crathes, Aberdeenshire, on Monday, at the age of 70. Eight years ago he retired from the position of managing director at Renfrew. He represented the second of three generations who have been associated with the firm. When he joined Alexander Ogston and Sons, Aberdeen, in the days before the firm's amalgamation, his father was representative for Aberdeen and district.

DR. E. A. RUDGE will shortly take up the post of head of the Science Department at West Ham Municipal College.

MR. W. F. A. ERMEN, of Combe Down, Bath, and formerly of Alderley Edge, Cheshire, research chemist, left estate valued £9,820, with net personalty £9,023.

DR. N. K. ADAM, a research chemist on the staff of Imperial Chemical Industries, Ltd., has been appointed Professor of Chemistry at University College, Southampton.

PROFESSOR L. H. BAEKELAND, honorary professor of chemical engineering at Columbia University, is to be offered the honorary degree of LL.D. by the University of Edinburgh.

MR. R. IBBOTSON has resigned from the post of demonstrator in non-ferrous metallurgy at Sheffield University. Dr. J. B. Speakman, lecturer at Leeds University, has been appointed to a readership in textile chemistry.

LORD LEVERHULME, president of the Society of Chemical Industry, will open an exhibition of arts and crafts at the John Benn Hostel this (Saturday) afternoon. The exhibition forms part of the tenth anniversary celebrations of the Hostel.

MR. W. LLOYD WILLEY, director of Thomas Hill-Jones, Ltd., has been travelling for the past four months in Egypt and the Near East, where his firm has a large factory and extensive business interests. He is returning to London next Thursday.

MR. H. A. COUVES, a director of Kelvin, Bottomley and Baird, Ltd., makers of scientific instruments, and also of the Thermal Syndicate, Ltd., has died in London. He was also general manager and a director of the North-Eastern Electric Supply Co.

DR. H. H. LOWRY, director of the coal research laboratory at the Carnegie Institute of Technology, Pittsburgh, who is visiting this country, will address the Institute of Fuel on the present work and future programme of his laboratory on April 19, in the lecture theatre of the Institution of Electrical Engineers. The meeting will be open to members of the Institution of Chemical Engineers.

MR. M. D. CURWEN will be the editor of the new journal, "Plastics," to be published shortly by the Temple Press, Ltd.

MR. C. H. GLASSEY has joined the board of British Industrial Plastics in place of Mr. J. C. Vredenburg-Inglesby, who has resigned.

MR. A. T. GREEN, at present assistant director, has been appointed director of research to the British Refractories Research Association.

MR. JOHN POMPHREY, a director of the Amoa Chemical Co., Ltd., from its inception, and lately also secretary of the company, has died at his home at Stanmore, Middlesex.

Forthcoming Events

LONDON.

Apr. 13.—Society of Chemical Industry. (Road and Building Materials Group). "The Use of Rubber in Road and Building Construction." B. D. Porritt. 8 p.m. Rooms of the Chemical Society, Burlington House, Piccadilly, London.

Apr. 14.—British Chemical and Dyestuffs Traders' Association. Annual general meeting. 3 p.m. Waldorf Hotel, Aldwych.

Apr. 14.—Society of Chemical Industry. (Food Group). Invitation meeting: Members of the Biochemical Society and Institute of Brewing are invited to participate. Papers and discussion on Protein Chemistry. 8 p.m. London School of Hygiene and Tropical Medicine, London.

Apr. 14.—Royal Society of Arts. "The Present Position and Prospects of the Coal Industry." Captain John P. Dickie. 8.15 p.m. John Street, Adelphi, London.

Apr. 15.—Society of Chemical Industry (London Section) and Chemical Society. Discussion on "Physico-Chemical Problems Involved in Distillation." Opened by Professor J. Reilly, Dr. A. J. V. Underwood and Dr. E. H. Farmer. 8 p.m. Burlington House, Piccadilly, London.

Apr. 16.—Royal Institution of Great Britain. "Science and the Conservation of Food: Some Special Problems." T. Macara. 9 p.m. 21 Albemarle Street, London.

BELFAST.

Apr. 14.—Institute of Chemistry. (Belfast Section.) Visit to Belfast Ropework Co., Ltd., Belfast.

BIRMINGHAM.

Apr. 16.—Institute of the Plastics Industry. (Birmingham Section). Prize papers. James Watt Memorial Institute, Birmingham.

LIVERPOOL.

Apr. 14.—British Association of Chemists. (Liverpool Section). Annual section meeting. 7.30 p.m. Exchange Hotel, Liverpool.

MANCHESTER.

Apr. 16.—Society of Dyers and Colourists. (Manchester Section). Annual meeting, short papers and discussion. 7 p.m. Rooms of the Literary and Philosophical Society, 36 George Street, Manchester.

SHEFFIELD.

Apr. 13.—Society of Glass Technology. 5.30 p.m. Glass Standards Committee meeting. 8.15 p.m. Refractories Committee meeting. 9 p.m. Furnace Committee meeting. King's Head Hotel, Sheffield.

Apr. 14.—Society of Glass Technology. 9.30 a.m. Council meeting. King's Head Hotel. 2 p.m. Annual general meeting. Applied Science Department, The University, St. George's Square, Sheffield.

STOKE-ON-TRENT.

Apr. 12.—Ceramic Society. (Pottery Section). "The Art of Filtration with Special Reference to Pottery Filter Presses." E. A. Alliott. 7.30 p.m. North Staffordshire Technical College, Stoke-on-Trent.

STOURBRIDGE.

Apr. 12.—Society of Glass Technology. (Midlands Section). Discussion on "Internal v. External Producers for Gas-fired Glass Melting Furnaces," between A. L. Marden and F. Winks. 7.30 p.m. Talbot Hotel, Stourbridge.

SWANSEA.

Apr. 13.—Institute of Metals. (Swansea Section). Annual general meeting. "Metallic Wear." H. W. Brownsdon. 6.30 p.m. Y.M.C.A., Swansea.

References to Current Literature

British

TEXTILES.—The adsorption of stannic chloride by silk fibroin. G. V. Jansen and E. A. Smith, *Canadian J. Research, 15,* B, 53-64.

The preservation of textiles for the fishing trade. J. W. Durant, *Dyer Textile Printer, 77,* 335-337.

VITAMINS.—Aneurin: A synthesis of aneurin. A. R. Todd and F. Bergel, *J.C.S.,* March, 1937, 364-369.

ANALYSIS.—Refractometric methods for determining protein. C. Siebenmann, *Biochem. J., 31,* 205-211.

Glucovanillin and a colour reaction for vanillin. W. V. Thorpe and R. Tecwyn-Williams, *J.C.S.,* March, 1937, 494.

Determination of the diastatic power of malt in degrees Lintner by means of a ferricyanide reagent. J. Ansel-Anderson and H. R. Salans, *Canadian J. Research, 15,* C, 70-77.

DYEING.—Wool characteristics: Properties as related to preparing, dyeing and finishing processes. G. D. Pratt, *Canadian Textile J., 54,* 35-38.

BREWING.—Filtration methods. D. Fox, *J. Incorp. Brewers' Guild, 23,* 62-77.

ORGANIC.—Amino-acids, acyl-amino-acids, dipeptides, acyl-dipeptides and derivatives of these compounds. A. J. Allen and others, *Biochem. J., 31,* 195-204.

HYDROCARBONS.—Reactions of olefines in the presence of metals. G. Egloff and C. I. Parrish, *Chem. and Ind., 56,* 321-325.

DYESTUFFS.—A new method for the identification of Naphthol Yellow S and a suggested mechanism of its fading. H. H. Hodgson and E. W. Smith, *J. Soc. Chem. Ind., 56,* 108T.

Pharmaceutical colouring agents. C. L. M. Brown, *Pharm. J., 138,* 344-345.

MISCELLANEOUS.—Spontaneous ignition under pressure of the simpler aliphatic hydrocarbons alcohols and aldehydes. G. P. Kane, E. A. C. Chamberlain, and D. T. A. Townend, *J.C.S.,* March, 1937, 436-443.

Modern developments in research on insecticides. I General survey, F. Tattersfield. II Insecticidal plant products, J. T. Martin, *J. Soc. Chem. Ind., 56,* 79-91T.

American

TANNING.—On the mechanism of the reaction between hide substances and basic chromium sulphate. D. H. Cameron, G. D. McLaughlin and R. S. Adams, *J. Amer. Leather Chem. Assoc., 32,* 98-113.

EMULSIONS.—The use of wax emulsions in surface sizing paper and board. R. W. Kumler, *Paper Trade J., 104,* 36-38.

INKS.—The use of wetting agents in printing inks. J. L. Burton, *Amer. Ink Maker, 15,* 21-23.

PIGMENTS.—The correct use of ball mills for wet grinding. O. Promnitz, *Paint Oil Chem. Rev., 99,* 22-24.

DYESTUFFS.—The influence of position isomerism on the colour and dyeing properties of monoazo dyes. W. R. Brode and M. E. Griffith, *Amer. Dyestuff Reporter, 26,* P90-99.

Dye preparations: Recent methods of production. H. Peters. *Textile Colorist, 59,* 171-173, 204.

TEXTILE FINISHES.—Permanent sizing with alkali-soluble cellulose ethers. W. H. Cohoe, *Textile Colorist, 59,* 183-189.

TEXTILES.—The mechanism of the sulphur lability in the alkali degradation of wool protein. J. A. Crowder and M. Harris, *Rayon Textile, 18,* No. 3, 47-48.

GLASS.—The effect of replacing dolomite lime by baryta upon some properties of glass. V. E. Wessels, *J. Amer. Ceramic Soc., 20,* 79-84.

ORGANIC.—Aminopyrine. M. A. Lesser, *Drug Cosmetic Ind., 40,* 356-358, 371.

The reduction of the pyridine ring by formic acid. F. R. Mayo, *J. Organic Chem., 1,* 496-503.

German

RUBBER.—The manufacture of india-rubber for erasing. W. Esch, *Gummi-Ztg., 51,* 291-292.

OILS AND FATS.—The removal of scum from vegetable oils and fats. Chr. Kerkloven, *Ole Fette Wachse, 1,* No. 1, 6-7.

The influence of sulphur and its compounds on mineral oils. F. Schmeling, *Oel u Kohle, 13,* 273-279.

TERPENES.—Terpineol and its esters. I. Herold. *Parfumerie Ztg., 23,* 93-95.

HYDROCARBONS.—Modern processes for the synthesis of hydrocarbons. G. Egloff, *Brennstoff-Chem., 18,* 115-117.

SOAP.—The application of sulphite waste lyes in the soap industry. K. Braun, *Fette u Seifen, 44,* 57-58.

COLLOIDS.—The colloid chemistry and technical washing properties of colloids in comparison with soap. K. Lindner, *Fette u Seifen, 44,* 47-51.

CORROSION.—On the resistance of light metals to corrosion by vegetable tanning agents, synthetic tanning agents, cellulose extracts, and various fatted tanned leathers. F. Stather and H. Nerfeld, *Collegium,* No. 801, 9-23.

ANALYSIS.—The estimation of glyceric acids in free and esterified form. S. Rapoport, *Biochem. Z., 289,* 406-410.

The application of potassium bisulphite to quantitative analytical determinations. A. Schwicker, *Z. analyt. Chem., 108,* 89-96.

The identification of animal fats and oils especially hardened train oil in mixtures of fats. S. H. Bertram, *Ole Fette Wachse, 1,* No. 2, 13-14.

POLYMERISATION.—The relationship between synthetic high molecular compounds and drying oils. E. Dreher, *Kunststoffe, 27,* 30-35.

TEXTILES.—Sizes for artificial silk and cellulose wool. W. Schramek, *Monatschrift Textil Ind., 52,* 81-84.

METALS.—The estimation of nickel in cobalt- and copper-containing steels. G. Balz, *Z. amorg. Chem., 231,* 15-23.

The metals of the rare earths. W. Klemm and H. Bommer, *Z. amorg. Chem., 231,* 138-171.

ORGANIC.—The preparation and properties of thiazol compounds. H. Erlenmeyer and H. von Meyenburg, *Helv. Chim. Act., 20,* 204-206.

French

SUGAR.—The importance of estimating the acidity and nitrogen content in beet sugar distillation. M. Martraire, *Bull. Assoc. Chim., 54,* 202-211.

HYDROLYSIS.—The hydrolysis of halogen alkyl compounds. S. C. J. Olivier, *Rev. Travaux Chim. Pays-Bays., 56,* 247-262.

INORGANIC.—Precipitation of copper sulphate by means of soda. M. Geloso and E. Giordano-Orsini, *Compt. rend., 204,* 589-590.

TEXTILES.—The significance of the *p*H value. C. Hodiamont, *L'Industrie Textile, 54,* 88-89.

ARTIFICIAL RESINS.—The polyvinyl and polyacrylic resins. R. Bluma, *Rev. Générale Matières Plastiques, 13,* 49-56.

DYEING.—Some applications of molybdenum compounds, particularly in dyeing. L. Debym, *Rev. Générale Teint. Imp. Blanch. App., 15,* 79-83.

OILS.—Molecular structure and the lubricity of lubricants. J. J. Trillat. *Rev. Générale Sciences, 48,* 95-107.

CELLULOID.—The yellowing of celluloid by light. P. Trévy, *Rev. Générale Matières Plastiques, 13,* 60-63.

ORGANIC.—The synthesis of amino-sulphonic acids of the fatty series. P. Rumpf, *Compt. rend., 204,* 592-595.

ANALYSIS.—Chemical analysis in the textile industry: Investigation identification and estimation of mineral pigments and metallic mordants. H. Tatu, *Rev. Générale Teint Imp. Blanch. App., 51,* 111-117.

A method for the estimation of ozone in very dilute condition based on the catalytic action of the gas in the oxidation of aldehydes. E. Briner and E. Perrottet, *Helv. Chim. Act., 20,* 293-298.

From Week to Week

IMPORT DUTIES (DRAWBACK) (No. 2) ORDER, 1937, (S.R. and O., 1937, No. 220), increases the rates of drawback in respect of certain unrefined fish and marine animal oils, and unrefined sperm oil, used in the manufacture of refined oils. The increases are consequent upon the rise in the prices of the unrefined oils and consequently in the amount of duty payable, and take effect from April 1.

AS A RESULT OF AN EXPLOSION at Nobel's explosive factory at Westquarter, near Polmont, Stirlingshire, on April 1, an employee, Jack Smith, was killed. He had been engaged in the detonator-charging department of the factory, and it is presumed that he was placing a plate containing filled detonators on a truck when the explosion took place. The shed in which he worked was completely wrecked.

A CONFERENCE OF COKE EXPORTERS has been convened in London for the end of April. Although the principal features of the international agreement, which has not yet been formally signed, have become effective, several questions are still under discussion. It is intended to secure the working of the scheme not only under present favourable market conditions, but also under less favourable conditions which may arise in the future.

TURNER AND NEWALL, LTD., have decided to establish an asbestos cement factory in Scotland, probably in the Clyde area. The company's present asbestos cement factories (operated through Turner's Asbestos Cement Co.) are at Trafford Park (Manchester), Widnes, Erith and Rhoose (Glamorganshire). The new factory will complete the geographical distribution of the points of manufacture.

MR. R. G. W. FARNELL, supplier of B.S.T. and Newchar carbons, of Conduit Street, Plumstead, has converted his business into a private limited liability company as from April 1. The business will be carried on as Farnell Carbons, Ltd., in exactly the same way as in the past. There will be no alteration in the personnel. The telephone number has been changed to Woolwich 1158 (two lines).

THE TELEPHONE NUMBER of the Saunders Valve Co., Ltd., is now Wolverhampton 21236 (two lines). The London number is unchanged.

THE NOMINAL CAPITAL of the Calor Gas (Distributing) Co., Ltd., has been increased by the addition of £25,000 beyond the registered capital of £25,000. The additional capital is divided into 25,000 7 per cent. cumulative preferred ordinary shares of £1.

STEWARTS AND LLOYDS, LTD., have decided to increase the iron and steel ingot capacity of their Corby works by some 150,000 tons per annum, bringing the total pig-iron and steel ingot capacity up to about 600,000 tons per annum.

THE ANGLO-SAXON PETROLEUM CO., a subsidiary of the Royal Dutch Co., and Shell Transport and Trading Co., are to increase their capital from £25,000,000 to £40,000,000. The company's present capital is in 1,500,000 "A" shares of £10 each, all of which are owned by Royal Dutch, and 1,000,000 "B" shares of £10 each, owned by Shell.

IN VIEW of the growing public interest in the activities of the National Institute of Industrial Psychology shown in recent years, the council has been considering what steps should be taken to cope with its increasing work. As a result, Mr. T G. Rose has been appointed general director of the Institute to collaborate with Dr. C. S. Myers, the principal, who will retain the position held by him since its inception sixteen years ago.

LANCEGAYE SAFETY GLASS (1934), LTD., has acquired land and freehold premises of approximately 8½ acres at Willesden Junction. It is understood that this new factory will be in production at an early date and that it will be designed to produce not less than 3,000,000 feet of toughened and laminated safety glass yearly. Legal proceedings with reference to an alleged infringement of certain Letters Patent held by another company were referred to in a statement issued in February last by the directors. An offer, by way of rights, was made to shareholders on February 11 last of three new 1s. shares in the proportion of one in three at the price of 3s. per share.

Chemical Trade Inquiries

The following trade inquiries are abstracted from the "Board of Trade Journal." Names and addresses may be obtained from the Department of Overseas Trade (Development and Intelligence), 35 Old Queen Street, London, S.W.1 (quote reference number).

South Africa.—The British Trade Commissioner at Johannesburg reports that the Johannesburg City Council is calling for tenders, to be presented in Johannesburg, South Africa, by April 24, for the supply of a centrifugal pump and motor for erection at the Antea Sewage Disposal Works, Maraisburg Road, Industria, Johannesburg. (Ref. T.Y. 2448.)

Belgium and Grand Duchy of Luxemburg.—A merchant firm, who are also manufacturers, established at Brussels, wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of solvents for cellulose and celluloid diluents, plastics, colouring materials, resins, nitro-cotton, collodions and all cellulose materials, acetate of cellulose (raw and finished), celluloid in sheets, plates and sticks. (Ref. No. 45.)

Norway.—An agent established at Bergen wishes to obtain the representation, on a commission basis, of United Kingdom manufacturers of raw materials for soap manufacture. (Ref. No. 49.)

Poland.—An agent established at Lodz wishes to obtain the representation of United Kingdom manufacturers of artificial silk (acetate and viscose), natural silk, chemicals and aniline dyes. (Ref. No. 50.)

Egypt.—A Cairo firm wishes to represent a United Kingdom manufacturer of dyestuffs in the Egyptian market. (Ref. No. 54.)

Egypt.—The British Consul-General at Alexandria reports that the Alexandria Municipality is calling for tenders (Contract No. 1379) for the supply and delivery of quantities of paints, varnishes, enamels, oils, barytes, calcium carbonate, washing soda, putty, white lead—powder, white and coloured cotton waste, etc. Tenders endorsed "Oils and Paints" should be addressed to the Director-General, Alexandria Municipality, Alexandria, Egypt, by whom they will be received up to noon on April 21.

New Companies Registered

Harry B. Wood (1937), Ltd.—Registered April 1. Nominal capital £5,000. To acquire the business of chemical merchants and manufacturers and foreign produce dealers carried on by Harry B. Wood, Ltd., at Cathedral Street, Manchester. Directors: Harry B. de L. Wood, 151 Bury Old Road, Manchester 8, A. Woodall, B. Brickles, senr., J. W. C. Bagshaw, and J. Macauley.

Company News

Wright, Layman and Umney.—A final dividend of 7½ per cent. making 10 per cent., less tax, is announced for 1936.

Sternol.—The report for 1936 shows a profit of £3,387 (against £7,286); add £6,058 brought in, making £9,445; to reserve for tax £400; dividend 4 per cent. in respect of preference arrears, £4,612; £4,232 forward.

John Thompson Engineering Co.—The directors recommend a final ordinary dividend of 12½ per cent., making 17½ for the period to December 31, 1936.

Olympic Portland Cement.—The directors recommend a final dividend on the ordinary shares of 5 per cent., less tax, making 7½ per cent. for the year 1936. For 1935 the total payment was 5 per cent., tax free to shareholders outside the United Kingdom.

Burmah Oil.—Half-yearly dividends to December 31 last on 6 per cent. cumulative first preference, 6 per cent. cumulative second preference, and 8 per cent. cumulative preference stocks will be paid, less tax at 3s. 7d. (being British tax, less relief in respect of Dominion tax), on April 30 to stockholders registered at close of business on April 5.

British Drug Houses.—The directors recommend a dividend of 6 per cent., less tax, on the ordinary shares for the year ended December 31 last. For the past four years the holders of the £400,000 ordinary capital have received 1 per cent. less at 5 per cent. Of the £750,000 authorised capital, £725,000 is in issue, there being, in addition to the ordinary shares, £325,000 in 5 per cent. cumulative preference shares.

Associated Dyers and Cleaners.—A sharp increase in the trading profit for 1936 from £1,888 to £50,940 is reported. The net loss of £27,707 in 1935 is converted into a net profit of £17,263, after allowing £30,164 for depreciation and charging a non-recurring item of special expenditure of £4,188. This is applied in reduction of the debit balance at profit and loss. The last dividend on the ordinary £1 shares was 6 per cent. for 1930. A scheme of reconstruction is to be submitted immediately after the general meeting, and the issued capital is to be written down from £1,000,000 to £525,000.

John Dickinson and Co.—The net profit for the year ended December 31, 1936, after providing for interest on debenture stock, depreciation and tax, amounts to £277,016, which, with the £70,567 frought forward from the last account, makes £347,583. The dividend on the preference stocks and an interim on the ordinary have been paid, leaving £272,083. After applying £8,000 to the sinking fund for the redemption of debenture stock, the directors recommend a final dividend of 6 per cent. and bonus of 2 per cent. on the ordinary stocks, maintaining the total at 12 per cent. for the year.

Inventions in the Chemical Industry

THE following information is prepared from the Official Patents Journal. Printed copies of Specifications accepted may be obtained from the Patent Office, 25 Southampton Buildings, London, W.C.2, at 1s. each. The numbers given under "Applications for Patents" are for reference in all correspondence up to the acceptance of the Complete Specification.

Specifications Open to Public Inspection

MANUFACTURE OF BORON CARBIDES.—Dr. A. Wacker Ges Fur Elektrochemische Industrie Ges. Sept. 17, 1935. 21551/36.

EXTRACTION OF ALUMINA FROM CLAYS, kaolin, bauxites, and the like.—P. Ippersiel. Sept. 21, 1935. 21852/36.

DEWAXING MINERAL OIL.—Texaco Development Corporation. Sept. 20, 1935. 23078/36.

PROCESS FOR THE INTRODUCTION OF ARYL GROUPS into α-β-unsaturated carbonyl compounds and their derivatives.—Schering-Kahlbaum, A.-G. Sept. 17, 1935. 24321/36.

REMOVAL OF WEAK GASEOUS ACIDS FROM GASES.—I. G. Farbenindustrie. Sept. 20, 1935. 25025/36.

ARTICLES THAT ARE SUBJECTED TO AND MUST RESIST ATTACK BY SOLUTIONS containing free chlorine or hypochlorous acid, its salts, and solutions thereof.—Stahlwerke Rochling-Buderus, A.-G. Sept. 16, 1935. 25268/36.

ADHESIVES DERIVED FROM ANIMAL GLUE.—E. Geistlich Sohne, A.-G., Fur Chemische Industrie. Sept. 19, 1935. 25503/36.

MANUFACTURE OF DYESTUFFS of the anthraquinone series.—I. G. Farbenindustrie. Sept. 21, 1935. 25540/36.

MANUFACTURE OF MONOAZO-DYESTUFFS insoluble in water.—I. G. Farbenindustrie. Sept. 21, 1935. 25623/36.

PROCESS FOR THE MANUFACTURE OF UREA and formaldehyde varnishes and products obtained.—P. Michaut. Sept. 25, 1935. 11527/36.

PROCESS OF PRODUCING HYDROGEN PEROXIDE.—H. Schmidt. Sept. 26, 1935. 16440/36.

PRODUCTION OF MAGNESIUM AND OTHER ALKALI-EARTH METALS by electrolysis of fused electrolytes.—Magall, A.-G. Sept. 27, 1935. 18695/36.

INSECTICIDES.—Rohm and Haas Co. Sept. 27, 1935. 22920/36.

MANUFACTURE OF MIXED CARBIDES and of articles made therefrom.—Keramet Ges. Sept. 26, 1935. 24734/36.

PROCESS AND APPARATUS FOR PRODUCING SOAP.—Refining, Inc. Sept. 26, 1937. 25267/36.

PROCESS FOR THE CATALYTIC HYDROGENATION OF POLYMERS of unsaturated hydrocarbons.—International Hydrogenation Patents Co., Ltd. Sept. 28, 1935. 26214/36.

MANUFACTURE OF NITRILES OF THE C_5-SERIES containing oxygen. I. G. Farbenindustrie. Sept. 28, 1935. 26247/36.

MANUFACTURE OF POLYMERISATION PRODUCTS.—I. G. Farbenindustrie. Sept. 28, 1935. 26248/36.

PROCESSES INVOLVING THE HEATING OF SOLID COMPOUNDS which normally swell on heating.—I. G. Farbenindustrie. Sept. 27, 1935. 26262/36.

MANUFACTURE OF ZINC OXIDE, particularly of zinc white pigments.—Smelting Metallurgischeund Metallwerke, A.-G. Sept. 28, 1935. 26300/36.

Specifications Accepted with Date of Application

PROCESS OF IMPARTING HYDROPHOBIC PROPERTIES TO CELLULOSE FIBRES.—W. W. Groves (I. G. Farbenindustrie.) June 21, 1935. 463,300.

PROCESS FOR MAKING AQUEOUS EMULSIONS OF RESIN and paraffin wax.—E. E. Mayer (K. Sonder). July 23, 1935. 463,187.

INSOLUBLE AZO COMPOUNDS.—E. I. du Pont de Nemours and Co. Sept. 20, 1934. 463,305.

MANUFACTURE OF AN ORTHO-OXY-AZO-DYESTUFF.—I. G. Farbenindustrie. Dec. 18, 1934. 463,192.

MANUFACTURE OF YARNS, FABRICS, FILMS, and the like of organic esters of cellulose.—H. Dreyfus. Sept. 23, 1935. 463,323.

MANUFACTURE OF DERIVATIVES OF CELLULOSE and other polymeric hydroxy compounds.—British Celanese, Ltd., E. B. Thomas, and H. F. Oxley. Sept. 23, 1935. 463,317.

WET PURIFICATION OF GASES, especially coal distillation gases.—G. W. Johnson (I. G. Farbenindustrie.) Sept. 26, 1935. 463,263.

MANUFACTURE AND PRODUCTION OF LIQUID HYDROCARBONS, especially those of low boiling point, from gaseous hydrocarbons. G. W. Johnson (I. G. Farbenindustrie.) Sept. 30, 1935. 463,328.

MANUFACTURE AND PRODUCTION OF VINYL COMPOUNDS.—Coutts and Co., and F. Johnson (Legal representatives of J. Y. Johnson (deceased)). (I. G. Farbenindustrie.) Oct. 10, 1935. 463,138.

CATALYTIC MATERIAL FOR CHEMICAL REACTIONS and process of producing and applying same.—A. L. Mond (Universal Oil Products Co.). Oct. 17, 1935. 463,272.

COOLING OF GASES, in particular those having a high content of water vapour.—G. W. Johnson (I. G. Farbenindustrie.) Oct. 28, 1935. 463,200.

PRODUCTION OF ALKENES OR ALKENE MIXTURES in a pure or substantially pure condition or of derivatives thereof.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. Dec. 21, 1934. 463,282.

METHOD OF PRODUCING ACTIVATED CHARCOAL.—S. Percival. June 6, 1936. 463,226.

MANUFACTURE OF WATER-SOLUBLE HETEROCYCLIC MERCURY COMPOUNDS.—Soc. of Chemical Industry in Basle. Nov. 29, 1935. 463,220.

MANUFACTURE OF ESTERS of polynuclear cyclic oxyketones.—Soc. of Chemical Industry in Basle. Aug. 2, 1935. 463,163.

PROCESS FOR MANUFACTURING OLEFINES.—Naamlooze Venootschap de Bataafsche Petroleum Maatschappij. Nov. 29, 1935. 465,244.

RECOVERY OF SULPHUR.—R. F. Bacon. Oct. 18, 1934. 463,184.

MANUFACTURE OF DYES.—Kodak, Ltd., and B. Beilenson. June 11, 1935. 462,820.

PREPARATION OF COLOUR LAKES.—A. Hancock, S. F. W. Crundall, and P. Spence and Sons, Ltd. June 12, 1935. 462,968.

METHODS OF PREPARING ORGANIC FLUORINE COMPOUNDS.—W. W. Triggs (Kinetic Chemicals, Inc.). June 14, 1935. 462,969.

METHOD FOR THE MANUFACTURE OF THERAPEUTIC PREPARATIONS liberating carbonic acid.—J. G. Waldenmeyer. Dec. 18, 1934. 463,035.

PRODUCTION OF SOLUTIONS OF GLUCOSIDES AND ALKALOIDS which are insoluble or only sparingly soluble in water.—Dr. H. John. July 15, 1935. 462,972.

MANUFACTURE OF ALKYL PHENOLS and related compounds.—G. T. Morgan, and N. J. L. Megson. Aug. 2, 1935. 463,036.

MEDIUM FOR AND METHOD OF DETECTING THE PRESENCE OF MUSTARD GAS.—O. H. Drager. Aug. 12, 1935. (Addition to 431,809.) 462,822.

MANUFACTURE OF COSMETIC PRODUCTS.—Chemische Fabric Grunau, Landshoff, and Meyer, A.-G. Sept. 20, 1934. 462,977.

MANUFACTURE OF 3-ALKOXY-4-OXYBENZALDEHYDES.—Dr. C. N. Geneff. Sept. 13, 1935. 462,901.

MANUFACTURE AND PRODUCTION OF VINYL ETHERS.—Coutts and Co., and F. Johnson (I. G. Farbenindustrie.) Sept. 14, 1935. 462,903.

TREATMENT OF CELLULOSIC MATERIALS.—Bleachers Association, Ltd., W. Kershaw, and C. J. Whitelegg. Sept. 16, 1935. 462,824.

MANUFACTURE AND PRODUCTION OF DYESTUFFS.—Coutts and Co., and F. Johnson (I. G. Farbenindustrie.) Sept. 16, 1935. 463,042.

MANUFACTURE OF LIGHT METALS BY ELECTROLYSIS.—E. I. du Pont de Nemours and Co., and R. E. Hulse. Sept. 16, 1935. 462,828.

MANUFACTURE OF DERIVATIVES OF ANTHRAQUINONE.—E. I. du Pont de Nemours and Co., A. J. Wuertz, and M. S. Whelen. Sept. 16, 1935. 463,045.

MANUFACTURE OF PLASTER BOARD and the like.—V. Lefeburge, and Imperial Chemical Industries, Ltd. Sept. 16, 1935. 462,829.

PROCESS FOR THE MANUFACTURE OF WATER-INSOLUBLE AZO DYESTUFFS.—A. Carpmael (I. G. Farbenindustrie.) Sept. 16, 1935. 463,046.

MANUFACTURE OF OXYGENATED ORGANIC COMPOUNDS.—British Celanese, Ltd. Sept. 18, 1934. 462,906.

PRODUCTION OF LIQUID AIR, and the production of oxygen therefrom, and the liquefaction and separation of other gases.—G. Maiuri. Sept. 18, 1935. 462,981.

MANUFACTURE OF CATALYTIC MATERIALS.—E. I. du Pont de Nemours and Co. Sept. 19, 1934. 463,055.

PRODUCTION OF ALKALI CELLULOSE particularly useful for making cellulose esters or ethers.—E. I. du Pont de Nemours and Co. Sept. 19, 1934. 463,056.

Applications for Patents

(March 18 to 23 inclusive.)

PRODUCTION OF CONDENSATION PRODUCTS FROM FORMALDEHYDE AND UREA.—Bakelite Ges. (Germany, April 28, '36.) 8055.

PRODUCTION OF CONDENSATION PRODUCTS from formaldehyde and urea.—Bakelite Ges. (Germany, June 25, '36.) (Cognate with 8055.) 8056.

PRESERVATION OF OILS, ETC.—British Association of Research for the Cocoa, Chocolate, Sugar Confectionery and Jam Trades, W. J. Stainsby, T. Macara and L. E. Campbell. 8547.

MANUFACTURE OF AZO-DYESTUFFS.—A. Carpmael (I. G. Farbenindustrie.) 8029.

MANUFACTURE OF BASIC METHYL MERCURY NITRATE.—A. Carpmael (I. G. Farbenindustrie.) 8030.

TREATMENT OF TEXTILE MATERIALS.—A. Carpmael (I. G. Farbenindustrie.) 8150.

MANUFACTURE OF METHYL MERCURIC COMPOUNDS.—A. Carpmael (I. G. Farbenindustrie.) 8526.

WATER-SOLUBLE, ETC. ORGANIC DERIVATIVES of polymeric metaphosphoric acids.—J. A. Benckiser Ges. Chemische Fabrik. (Germany, March 19, '36.) 8197.

LOW-TEMPERATURE CARBONISATION.—F. Clegg, and L. Clegg. 8481.

MANUFACTURE OF DYESTUFFS FOR CELLULOSE ESTERS, ETC.—Compagnie Nationale de Matiéres Colorantes et Manufactures de

Produits Chimiques du Nord Réunis Etablissements Kuhlmann. (France, March 24, '36.) 8357.

FLUORESCENT SUBSTANCE.—Degea, A.-G. (Germany, March 21, '36.) 8433, 8434.

CARTRIDGE CONTAINING LIQUID-AIR OR OXYGEN.—De Wendel et Cie, Les Petits-fils de F. (France, March 21, '36.) 8107.

POLYMERISATION OF ORGANIC COMPOUNDS.—Distillers Co., Ltd., H. M. Stanley, and H. P. Staudinger. 8519.

INHIBITION OF OXYGEN IN HYDROCARBON, ETC., OILS.—J. D. Doyle. 8252.

FORMING RUBBER SUBSTITUTES BY POLYMERISATION OF HALOGEN-2-BUTADIENES-1, 3.—E. I. du Pont de Nemours and Co. (United States, March 19, '36.) 8109.

POLYMERISING A HALOGEN-2-BUTADIENES-1, 3.—E. I. du Pont de Nemours and Co. (United States, March 19, '36.) 8110.

STABILISING PLASTIC POLYMERS OF HALOGEN-2-BUTADIENES-1, 3.—E. I. du Pont de Nemours and Co. (United States, March 19, '36.) 8111.

SYNTHETIC RESINS.—E. I. du Pont de Nemours and Co. (United States, March 19, '36.) 8184.

POLYHYDRIC ALCOHOL-POLYBASIC ACID RESINS.—E. I. du Pont de Nemours and Co. (United States, April 9, '36.) 8428.

PURIFICATION OF COMBUSTIBLE GASES.—Gas Light and Coke Co., and R. H. Griffith. 8206.

RESINOUS CONDENSATION PRODUCTS of the Resole type soluble in weak alkalies and their manufacture.—J. R. Geigy, A.-G. (Germany, March 19, '36.) 8025.

MANUFACTURE OF WATER-SOLUBLE CONDENSATION PRODUCTS containing phosphorous.—J. R. Geigy, A.-G. (Germany, March 21, '36.) 8364.

DESULPHURISATION OF GASES, ETC.—A. T. du Valon Green. 8138.

LOW-TEMPERATURE CARBONISATION.—P. Hadamovsky. 8014.

MANUFACTURE OF FERTILISERS.—K. Hosokawa. 8527.

TREATMENT OF AMMONIACAL SOLUTIONS OF METAL SALTS.—I. G. Farbenindustrie. (Germany, April 4, '36.) 7981.

MANUFACTURE OF ABSORPTIVE MATERIALS.—I. G. Farbenindustrie. (Germany, April 2, '26.) 8136.

APPARATUS FOR DIALYSING LIQUIDS.—I. G. Farbenindustrie. (Germany, April 29, '36.) 8362.

MANUFACTURE, ETC. OF FORMIC ACID.—I. G. Farbenindustrie. (Germany, March 25, '36.) 8532.

CLEANING GASES.—Imperial Chemical Industries, Ltd. 8034.

COLOURING ACETATE ARTIFICIAL SILK.—Imperial Chemical Industries, Ltd., R. H. Sennett, M. Lapworth, and A. H. Knight. 8035.

PURIFICATION OF CAUSTIC SODA.—Imperial Chemical Industries, Ltd. 8036.

PRODUCTION OF DERIVATIVES OF ETHYLENE.—Imperial Chemical Industries, Ltd., and E. W. Fawcett. 8185.

MONOAZO DYESTUFFS.—Imperial Chemical Industries, Ltd., and A. H. Knight. 8529.

RECOVERY OF CALCIUM CARBONATE capable of being filtered in the manufacture, etc., of ammonium sulphate from calcium sulphate.—G. W. Johnson (I. G. Farbenindustrie). 7992.

MANUFACTURE, ETC., OF DYESTUFFS.—G. W. Johnson (I. G. Farbenindustrie.) 8129.

MANUFACTURE, ETC., OF NITROGENOUS PRODUCTS.—G. W. Johnson (I. G. Farbenindustrie.) (Aug. 22, '35.) 8249, 8250, 8251.

MANUFACTURE, ETC., OF VALUABLE NITROGENOUS PRODUCTS.—G. W. Johnson (I. G. Farbenindustrie.) (April 21, '36.) 8324, 8325, 8326.

EXTRACTING MAGNESIUM FROM SEAWATER ELECTRO-CHEMICALLY.—S. H. Lundberg. 8146.

MANUFACTURE OF COMPLEX NICOTINE PRODUCTS, ETC.—Lunevale Products, Ltd., and M. Fitzgibbon. 8270.

TREATMENT OF CELLULOSE.—Maschinenfabrik Imperial Ges. (Germany, April 27, '36.) 8366.

RESINOUS MATERIAL FOR MOULDING, and method of preparing same.—Mead Corporation. (United States, April 9, '36.) 8155.

CONCENTRATION OF AQUEOUS DISPERSIONS OF RUBBER, ETC.—Metallges, A.-G. (Germany, March 21, '36.) 8059.

MANUFACTURE OF SODIUM PHENATE.—Monsanto Chemicals, Ltd., S. Smith, and W. H. Garrett. 8047.

MANUFACTURE OF PRODUCTS OF HIGH-MOLECULAR WEIGHT soluble in oils.—Naamlooze Vennootschap de Bataafsche Petroleum Maatschappij. (Holland, March 24, '36.) 8431.

DYEING ARTIFICIAL SILK.—Naamlooze Vennootschap Onderzoekingsinstituut Research. (Germany, March 31, '36.) 8543.

PRODUCTION OF ANHYDROUS CITRIC ACID.—C. Pfizer and Co., and F. K. Donovan. 8429.

PURIFICATION OF COMBUSTIBLE GASES.—J. H. G. Plant. 8206.

ISOLATION OF ZEIN.—J. E. Pollak (International Patents Development Co.). 7958.

PRODUCTION OF ZEIN.—J. E. Pollak (International Patents Development Co.). 7967.

PRODUCTION OF PROTEIN PLASTICS.—J. E. Pollak (International Patents Development Co.). 7968.

PRODUCTION OF PLASTICS COMPRISING ZEIN.—J. E. Pollak (International Patents Development Co.). 7969.

PRODUCTION OF PROTEIN ADHESIVES.—J. E. Pollak (International Patents Development Co.). 7970.

COATING OF FIBROUS ARTICLES and products produced thereby. J. E. Pollak (International Patents Development Co.). 7999.

PRODUCTION OF FLEXIBLE PROTEIN PRODUCTS.—J. E. Pollak (International Patents Development Co.). 8000.

PRODUCTION OF MOULDED FIBROUS PRODUCTS.—J. E. Pollak (International Patents Development Co.). 8001.

PRODUCTION OF PLASTICISED PRODUCTS.—J. E. Pollak (International Patents Development Co.). 8002.

PRODUCTION OF VALUABLE HYDROCARBON OILS from extraction products of solid carbonaceous materials.—H. E. Potts (International Hydrogenation Patents Co., Ltd.). 8223.

Chemical and Allied Stocks and Shares

SINCE the beginning of the new Stock Exchange account on Monday there has been increased activity in industrial shares and a tendency towards higher prices. There were numerous features of interest attaching to shares of chemical and allied companies. Imperial Chemical at 38s. 3d. are below the price ruling a week ago, but are little changed allowing for the fact that the price is now "ex" the final dividend. The fact that despite the increased profits a conservative policy is again being followed did not come as a surprise as the market was not budgeting for more than the maintenance of the dividend at 8 per cent. Salt Union were again steady at 40s. and there was again a firm tendency reported in B. Laporte, which are held rather tightly on the company's good profit-earning record and the possibility of an increased dividend or a bonus distribution. Turner and Newall were better at 103s. 3d. Some market men are taking the view that a further large increase in the latter company's profits may be in prospect, it being suggested that it is placed in a favourable position because it owns supplies of raw materials. The business includes the mining of asbestos as well as the manufacture and distribution of asbestos products.

Imperial Smelting at 21s. 10½d. did not keep best prices, having been affected moderately by the lower price of zinc. United Molasses were a prominent feature, there having been a further advance on the week from 31s. 7½d. to 34s. in response to rising tanker freight rates. The market is budgeting for an increased dividend, and is already talking of a minimum total payment of 20 per cent. for the year. Lever Bros. preference shares have remained firm on the excellent cover for their dividend requirements indicated by the recently-issued results. On the other hand, Unilever were lower at 41s. on doubts whether the impending results will announce a larger dividend, although it is expected that higher profits will be shown. General Refractories were more active, aided by the favourable impression created by the statements at the meeting, and despite the fact that they are now "ex" the final dividend they have risen 1s. on the week to 31s. 6d. Leeds Fireclay preference and ordinary shares continued to receive rather more attention.

British Drug Houses were little changed at 21s. 6d. at which they would seem very moderately valued, having regard to the favourable dividend record and the increased payment for the past year. Boots Pure Drug at 53s. were steadier, and there was also little change in prices of Sangers and Timothy Whites and Taylors. Michael Nairn and Greenwich and Barry and Staines Linoleum were fairly steady, but there is uncertainty in the market whether the forthcoming results of the last-named company are likely to show a larger dividend as the directors might decide to follow a very conservative policy if they fear any further rise in prices of raw materials.

Wall Paper deferred were little changed at 41s. 3d., awaiting the interim dividend announcement. Pinchin Johnson and other paint shares were steady, sentiment having benefited from attention drawn to the encouraging views expressed at the recent meetings of companies in the trade. Blythe Colour Works 4s. shares, which are now "ex" the dividends are 11s. 9d., or within 3d. of the price ruling a week ago. Metal Traders and Amalgamated Metal shares were again active, particularly the first named. British Oxygen did not keep best prices, but there was a better tendency in Murex. Elsewhere Richard Thomas were reported to be firmer, sentiment having been assisted by the upward tendency in tinplate prices. Dorman Long were also better, but the general tendency among iron, steel and allied shares was to rather lower prices.

Leading oil shares have been more active at higher prices, there having been response to the encouraging estimates current in the market with regard to the forthcoming "Shell," Anglo-Iranian and Burmah Oil dividends. There is also talk of a larger interim dividend from Trinidad Leaseholds, despite the larger capital ranking.

Weekly Prices of British Chemical Products

THERE are no price changes to report in the London markets for general heavy chemicals, rubber chemicals, wood distillation products, perfumery chemicals, essential oils and intermediates. In the coal tar products section there have been slight increases during the week in the prices of cresylic acid 97/99 per cent., naphtha solvent 95/160 per cent., and pyridine 90/140 per cent., and 90/180 per cent.

MANCHESTER.—Trading in chemicals on the Manchester market has fully recovered from the effects of the holiday and fairly active conditions have been reported during the past week. The demand for supplies against contract commitments has been resumed on steady lines and specifications are covering fair quantities of most of the leading products. Actual new business this week in respect of near deliveries has been on a moderate scale, with a sprinkling of new contracts reported. The white and red leads have been reduced by £1 per ton, and there has been some easiness in other products associated with the non-ferrous metals, but in most other respects the market has been firm. Among the by-products most sections are also firm, especially cresylic acid, which has further advanced, whilst both crude and refined tar are stronger in tendency.

GLASGOW.—The chemical market shows a slight improvement with a tendency to quote only for spot lots. There has been a steady day to day demand for chemicals for home trade during the week, and rather more inquiry for export. Prices generally continue very firm at about previous figures, and borax and boric acid have both been advanced 30s. per ton. Lead products generally remain unchanged from last week's figures. There has not been a great deal of fresh business done in coal tar products during the week, but inquiries are numerous in most departments and the demand for lighter fractions is definitely strong. Shortage of supplies is the growing hindrance on the cresylic acid market, and the few fresh transactions reported have been concluded at highest competitive prices. Fair quantities of motor benzole have changed hands within the range of values quoted. Creosote continues very steady. Solvent naphthas are maintaining without difficulty their present price levels and 90/160 shows if anything a tendency to firm.

General Chemicals

ACETONE.—£45 to £47 per ton.

ACID, ACETIC.—Tech., 80%, £30 5s. to £32 5s. per ton; pure 80%, £30 5s.; tech., 40%, £15 12s. 6d. to £18 12s. 6d.; tech., 60%, £23 10s. to £25 10s. MANCHESTER: 80%, commercial, £30 5s.; tech. glacial, £42 to £46.

ACID, BORIC.—Commercial granulated, £28 10s. per ton; crystal, £29 10s.; powdered, £30 10s.; extra finely powdered, £32 10s. in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Crystals, £29 10s.; powdered, £30 10s. 1-cwt. bags in 1-ton lots.

ACID, CHROMIC.—9¼d. per lb., less 2½%; d/d U.K.

ACID, CITRIC.—1s. per lb. MANCHESTER: 1s. SCOTLAND: B.P. crystals, 1s. per lb., less 5%, ex store.

ACID, FORMIC.—85%, in carboys, ton lots, £42 to £47 per ton.

ACID, HYDROCHLORIC.—Spot, 5s. to 7s. 6d. carboy d/d according to purity, strength and locality.

ACID, LACTIC.—LANCASHIRE: Dark tech., 50% by vol., £24 10s. per ton; 50% by weight, £28 10s.; 80% by weight, £50: pale tech., 50% by vol., £28; 50% by weight, £33; 80% by weight, £55; edible, 50% by vol., £41. One-ton lots ex works, barrels free.

ACID, NITRIC.—80° Tw. spot, £18 to £25 per ton makers' works.

ACID, OXALIC.—£48 15s. to £57 10s. per ton, according to packages and position. GLASGOW: £2 9s. per cwt. in casks. MANCHESTER: £49 to £55 per ton ex store.

ACID, SULPHURIC.—168° Tw., £4 5s. to £4 15s. per ton; 140° Tw., arsenic-free, £2 15s. to £3 5s.; 140° Tw., arsenious, £2 10s.

ACID, TARTARIC.—1s. 1¼d. per lb. less 5%, carriage paid for lots of 5 cwt. and upwards. MANCHESTER: 1s. 1d. to 1. 1½d. per lb.

ALUM.—Loose lump, £8 7s. 6d. per ton d/d; GLASGOW: Ground, £10 7s. 6d. per ton; lump, £9 17s. 6d.

ALUMINIUM SULPHATE.—£7 per ton d/d Lancs.; GLASGOW: £7 to £8 ex store.

AMMONIA, ANHYDROUS.—Spot, 10d. per lb. d/d in cylinders. SCOTLAND: 10d. to 1s. containers extra and returnable.

AMMONIA, LIQUID.—SCOTLAND: 80°, 2¼d. to 3d. per lb., d/d.

AMMONIUM BICHROMATE.—8d. per lb. d/d U.K.

AMMONIUM CARBONATE.—£20 per ton d/d in 5 cwt. casks.

AMMONIUM CHLORIDE.—LONDON: Fine white crystals, £16 10s. (See also Salammoniac.)

AMMONIUM CHLORIDE (MURIATE).—SCOTLAND: British dog tooth crystals, £32 to £35 per ton carriage paid according to quantity. (See also Salammoniac.)

ANTIMONY OXIDE.—£55 10s. per ton.

ARSENIC.—LONDON: £13 10s. per ton c.i.f. main U.K. ports for imported material; Cornish nominal, £22 10s. f.o.r. mines. SCOTLAND: White powdered, £17 ex store. MANCHESTER: White powdered Cornish, £17, ex store.

BARIUM CHLORIDE.—£10 per ton. GLASGOW: £11 5s. per ton.

BISULPHITE OF LIME.—£6 10s. per ton f.o.r. London.

BLEACHING POWDER.—Spot, 35/37%, £8 15s. per ton in casks, special terms for contracts. SCOTLAND: £9 per ton net ex store.

BORAX COMMERCIAL.—Granulated, £16 per ton; crystal, £17; powdered, £17 10s.; extra finely powdered, £18 10s., packed in 1-cwt. bags, carriage paid home to buyers' premises within the United Kingdom in 1-ton lots. GLASGOW: Granulated, £16; crystal, £17; powdered, £17 10s. per ton in 1-cwt. bags, carriage paid.

CALCIUM CHLORIDE.—Solid 70/75% spot, £5 5s. per ton d/d station in drums. GLASGOW: 70/75% solid, £5 10s. per ton net ex store.

CHROMETAN.—Crystals, 2¾d. per lb.; liquor, £19 10s. per ton d/d

CREAM OF TARTAR.—£3 19s. per cwt. less 2½%. GLASGOW: 99%, £4 7s. per cwt. in 5-cwt. casks.

FORMALDEHYDE.—£22 10s. per ton.

GLYCERINE.—Chemically pure, double distilled, 1.260 s.g., in tins, £5 7s. 6d. to £6 7s. 6d. per cwt. according to quantity; in drums, £5 to £5 13s. 6d.

IODINE.—Resublimed B.P., 5s. 1d. per lb.

LEAD ACETATE.—LONDON: White, £35 10s. per ton; brown, £35. GLASGOW: White crystals, £34 to £35; brown, £1 per ton less. MANCHESTER: White, £37 10s.; brown £37.

LEAD NITRATE.—£39 per ton.

LEAD, RED.—SCOTLAND: £44 10s. per ton less 2½%, carriage paid, for 2-ton lots.

LEAD (WHITE SUGAR OF).—GLASGOW: £40 per ton net, ex store.

LITHARGE.—SCOTLAND: Ground, £44 10s. per ton, less 2½%, carriage paid for 2-ton lots.

MAGNESITE.—SCOTLAND: Ground calcined, £9 per ton, ex store.

MAGNESIUM CHLORIDE.—SCOTLAND: £7 10s. per ton.

MAGNESIUM SULPHATE.—Commercial, £5 per ton, ex wharf.

MERCURY.—Ammoniated B.P. (white precip.), lump, 5s. 11d. per lb.; powder B.P., 6s. 1d.; bichloride B.P. (corros. sub.) 5s. 2d.; powder B.P. 4s. 10d.; chloride B.P. (calomel), 5s. 11d.; red oxide cryst. (red precip.), 7s.; levig. 6s. 6d.; yellow oxide B.P. 6s. 4d.; persulphate white B.P.C., 6s. 1d.; sulphide black (hyd. sulph. cum sulph. 50%), 6s. For quantities under 112 lb., 1d. extra.

METHYLATED SPIRIT.—61 O.P. industrial, 1s. 5d. to 2s. per gal.; pyridinised industrial, 1s. 7d. to 2s. 2d.; mineralised, 2s. 6d. to 3s. Spirit 64 O.P. is 1d. more in all cases and the range of prices is according to quantities. SCOTLAND: Industrial 64 O.P., 1s. 9d. to 2s. 4d.

PARAFFIN WAX.—SCOTLAND: 3¾d. per lb.

PHENOL.—6¾d. to 7½d. per lb.

POTASH, CAUSTIC.—LONDON: £42 per ton. MANCHESTER: £39.

POTASSIUM BICHROMATE.—SCOTLAND: 5d. per lb., less 5%, carriage paid.

POTASSIUM CHLORATE.—£36 7s. 6d. per ton. GLASGOW: 4¼d. per lb. MANCHESTER: £38 per ton.

POTASSIUM IODIDE.—B.P. 4s. 3d. per lb.

POTASSIUM NITRATE.—£27 per ton. GLASGOW: Refined granulated, £29 per ton c.i.f. U.K. ports. Spot, £30 per ton ex store.

POTASSIUM PERMANGANATE.—LONDON: 9¾d. per lb. SCOTLAND: B.P. Crystals, 9¾d. MANCHESTER: B.P. 11d. to 1s.

POTASSIUM PRUSSATE.—6½d. per lb. SCOTLAND: 7d. net, in casks, ex store. MANCHESTER: Yellow, 6½d. to 6¾d.

SALAMMONIAC.—First lump spot, £41 17s. 6d. per ton d/d in barrels. GLASGOW: Large crystals, in casks, £38.

SALT CAKE.—Unground, spot, £3 16s. 6d. per ton.

SODA ASH.—58% spot, £5 12s. 6d. per ton f.o.r. in bags.

SODA, CAUSTIC.—Solid, 76/77° spot, £12 10s. per ton d/d station. SCOTLAND: Powdered 98/99%, £17 10s. in drums, £18 5s. in casks, Solid 76/77°, £14 12s. 6d. in drums; 70/73%, £14 12s. 6d., carriage paid buyer's station, minimum 4-ton lots; contracts 10s. per ton less.

SODA CRYSTALS.—Spot, £5 to £5 5s. per ton d/d station or ex depot in 2-cwt. bags.

SODIUM ACETATE.—£18 per ton carriage paid North. GLASGOW: £18 10s. per ton net ex store.

SODIUM BICARBONATE.—Refined spot, £10 10s. per ton d/d station in bags. GLASGOW: £12 15s. per ton in 1 cwt. kegs, £11 per ton in 2-cwt. bags. MANCHESTER: £10 10s.

SODIUM BICHROMATE.—Crystals cake and powder 4d. per lb. net d/d U.K. discount 5%. MANCHESTER: 4d. per lb. GLASGOW: 4d., less 5% carriage paid.

SODIUM BISULPHITE POWDER.—60/62%, £20 per ton d/d 1 cwt. iron drums for home trade.

SODIUM CARBONATE, MONOHYDRATE.—£15 per ton d/d in minimum ton lots in 2 cwt. free bags.

SODIUM CHLORATE.—£26 10s. to £30 per ton. GLASGOW: £1 10s. per cwt.

SODIUM CHROMATE.—4d. per lb. d/d U.K.

SODIUM HYPOSULPHATE.—Commercial, 2 ton lots d/d, £10 5s. per ton; photographic, £14 5s. MANCHESTER: Commercial, £10; photographic, £14 10s.
SODIUM METASILICATE.—£14 per ton, d/d U.K. in cwt. bags.
SODIUM NITRATE.—Refined, £7 15s. per ton for 6-ton lots d/d.
SODIUM NITRITE.—£18 5s. per ton for ton lots.
SODIUM PERBORATE.—10%, 9½d. per lb. d/d in 1-cwt. drums.
SODIUM PHOSPHATE.—£13 per ton.
SODIUM PRUSSIATE.—4d. per lb. for ton lots. GLASGOW: 5d. to 5¼d. ex store. MANCHESTER: 4¼d. to 4½d.
SODIUM SILICATE.—£9 10s. per ton.
SODIUM SULPHATE (GLAUBER SALTS).—£3 per ton d/d.
SODIUM SULPHATE (SALT CAKE).—Unground spot, £3 12s. 6d. per ton d/d station in bulk. SCOTLAND: Ground quality, £3 5s. per ton d/d. MANCHESTER: £3 10s.
SODIUM SULPHIDE.—Solid 60/62%, Spot, £11 5s. per ton d/d in drums; crystals 30/32%, £8 15s. per ton d/d in casks. MANCHESTER: Concentrated solid, 60/62%, £11; commercial, £8.
SODIUM SULPHITE.—Pea crystals, spot, £13 5s. per ton d/d station in kegs. Commercial spot, £8 15s. d/d station in bags.
SULPHATE OF COPPER.—£20 per ton, less 2%, in casks. MANCHESTER: £26 10s. per ton f.o.b. SCOTLAND: £26 per ton less 5%, Liverpool, in casks.
SULPHUR PRECIP.—B.P., £55 to £60 per ton according to quantity. Commercial, £50 to £55.
ZINC SULPHATE.—Crystals, £9 per ton, f.o.r., in bags.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 1d. per lb., according to quality. Crimson, 1s. 5½d. to 1s. 7d. per lb., according to quality.
ARSENIC SULPHIDE.—Yellow, 1s. 5d. to 1s. 7d. per lb.
BARYTES.—£6 to £7 10s. per ton, according to quality.
CADMIUM SULPHIDE.—6s. to 6s. 3d. per lb.
CARBON BISULPHIDE.—£31 to £33 per ton, according to quantity, drums extra.
CARBON BLACK.—3 11/16d. to 4 13/16d. per lb., ex wharf.
CARBON TETRACHLORIDE.—£41 to £46 per ton, according to quantity, drums extra.
CHROMIUM OXIDE.—Green, 1s. 2d. per lb.
DIPHENYLGUANIDINE.—2s. 2d. per lb.
INDIA-RUBBER SUBSTITUTES.—White, 4½d. to 5d. per lb.; dark, 3¾d. to 4¼d. per lb.
LAMP BLACK.—£22 to £23 per ton d/d London; vegetable black, £28 to £48.
LEAD HYPOSULPHITE.—9d. per lb.
LITHOPONE.—30%, £16 10s. to £17 5s. per ton.
SULPHUR.—£9 to £9 5s. per ton. SULPHUR PRECIP. B.P., £55 to £60 per ton. SULPHUR PRECIP. COMM., £50 to £55 per ton.
SULPHUR CHLORIDE.—5d. to 7d. per lb., according to quantity.
VERMILION.—Pale, or deep, 5s. 3d. per lb., 1-cwt. lots.
ZINC SULPHIDE.—10d. to 11d. per lb., according to quality.

Nitrogen Fertilisers

SULPHATE OF AMMONIA.—Neutral quality, basis 20.6 per cent. nitrogen, delivered in 6-ton lots to farmer's nearest station, £7 5s. per ton.
CALCIUM CYANAMIDE.—£7 5s. per ton, carriage paid to any railway station in Great Britain in lots of four tons and over.
NITRO-CHALK.—£7 5s. per ton for delivery to end of June.
NITRATE OF SODA.—£7 12s. 6d. per ton for delivery up to end of June.
AMMONIUM PHOSPHATE FERTILISERS.—£10 5s. to £13 15s. per ton for delivery up to end of June, delivered in 6-ton lots to farmer's nearest station.

Coal Tar Products

ACID, CRESYLIC.—97/99%, 4s. 6d. to 5s. per gal.; 99/100%, 4s. 10d. to 5s. 2d., according to specification; pale 99%, 4s. 8d. to 4s. 9d.; dark, 3s. 10d. to 4s. GLASGOW: Pale, 99/100%, 4s. 6d. to 4s. 10d. per gal.; pale 97/99%, 4s. 4d. to 4s. 8d.; dark, 97/99%, 3s. 6d. to 3s. 10d.; high boiling acids, 2s. 4d. to 2s. 8d. American specification, 3s. 6d. to 4s. MANCHESTER: Pale, 99/100%, 4s. 9d. to 5s.
ACID, CARBOLIC.—Crystals, 7d. to 7½d. per lb.; crude, 60's, 3s. 3d. to 3s. 6d. per gal. MANCHESTER: Crystals, 7¼d. per lb.; crude 3s. 6d. per gal. GLASGOW: Crude, 60's, 3s. 2d. to 3s. 8d. per gal.; distilled, 60's, 4s. to 4s. 1d.
BENZOL.—At works, crude, 9½d. to 10d. per gal.; standard motor 1s. 3d. to 1s. 3½d.; 90%, 1s. 4d. to 1s. 4½d.; pure, 1s. 8d. to 1s. 8½d. LONDON: Motor, 1s. 3½d. GLASGOW: Crude, 9½d. to 10½d. per gal.; motor, 1s. 4d. to 1s. 5d.
CREOSOTE.—B.S.I. Specification standard, 5¾d. to 6d. per gal. f.o.r. Home, 3¾d. d/d. LONDON: 4½d. f.o.r. North: 5d. London. MANCHESTER: 5½d. to 6d. GLASGOW: B.S.I. Specification 5½d. to 6d. per gal.; washed oil, 5d. to 5½d.; lower sp. gr. oils, 5d. to 5½d.
NAPHTHA.—Solvent, 90/160%, 1s. 7d. to 1s. 8d. per gal.; 95/160%, 1s. 8d.; 90/190%, 1s. 2d. to 1s. 3d. LONDON: Solvent, 1s. 3½d. to 1s. 4d.; heavy, 11d. to 1s. 0½d. f.o.r. GLASGOW: Crude, 6d. to 6¾d. per gal.; 90% 160, 1s. 6d. to 1s. 7d. 90% 190, 1s. 1d. to 1s. 2d.
NAPHTHALENE.—Crude, whizzed or hot pressed, £12 to £13 per ton; purified crystals, £18 to £20 per ton in 2-cwt. bags. LONDON: Fire lighter quality, £5 to £5 10s. per ton; crystals, £27 to £27 10s. GLASGOW: Fire lighter, crude, £6 to £7 per ton (bags free). MANCHESTER: Refined £23 per ton f.o.b.
PYRIDINE.—90/140%, 9s. to 10s. per gal.; 90/180, 2s. 9d. to 3s. 6d. GLASGOW: 90% 140, 9s. to 10s. per gal.; 90% 160, 7s. to 8s.; 90% 180, 2s. 6d.
TOLUOLE.—90%, 2s. per gal.; pure, 2s. 5d. GLASGOW: 90%, 120, 1s. 10d. to 1s. 11d. per gal.
PITCH.—Medium, soft, 36s. to 37s. per ton, in bulk at makers' works. MANCHESTER: 35s. f.o.b., East Coast. GLASGOW: f.o.b. Glasgow, 28s. 6d. to 35s. per ton; in bulk for home trade, 32s. 6d.
XYLOL.—Commercial, 2s. 2d. per gal.; pure, 2s. 4d. GLASGOW: Commercial, 1s. 11d. to 2s. per gal.

Wood Distillation Products

ACETATE OF LIME.—Brown, £8 10s. to £9 per ton; grey, £10 10s. to £11 10s. Liquor, brown, 30° Tw., 6d. to 8d. per gal. MANCHESTER: Brown, £9 10s.; grey, £11 10s.
CHARCOAL.—£5 15s. to £11 per ton, according to grade and locality.
METHYL ACETONE.—40-50%, £42 to £45 per ton.
WOOD CREOSOTE.—Unrefined 6d. to 1s. 6d. per gal., according to boiling range.
WOOD, NAPHTHA, MISCIBLE.—2s. 9d. to 3s. 3d. per gal.; solvent, 3s. 6d. to 3s. 9d. per gal.
WOOD TAR.—£2 10s. to £4 per ton.

Intermediates and Dyes

ACID, BENZOIC, 1914 B.P. (ex toluol).—1s. 9½d. per lb. d/d buyer's works.
ACID, GAMMA.—Spot, 4s. per lb. 100% d/d buyer's works.
ACID, H.—Spot, 2s. 4½d. per lb. 100% d/d buyer's works.
ACID NAPHTHIONIC.—1s. 8d. per lb.
ACID, NEVILLE AND WINTHER.—Spot, 3s. per lb. 100%.
ACID, SULPHANILIC.—Spot, 8d. per lb. 100%, d/d buyer's works.
ANILINE OIL.—Spot, 8d. per lb., drums extra, d/d buyer's works.
ANILINE SALTS.—Spot, 8d. per lb. d/d buyer's works, casks free.
BENZIDINE, HCl.—2s. 5d. per lb., 100% as base, in casks.
m-CRESOL 98/100%.—1s. 8d. to 1s. 9d. per lb. in ton lots.
o-CRESOL 30/31° C.—6½d. to 7½d. per lb. in 1-ton lots.
p-CRESOL 34-5° C.—1s. 7d. to 1s. 8d. per lb. in ton lots.
DICHLORANILINE.—2s. 3d. per lb.
DIMETHYLANILINE.—Spot, 1s. 6d. per lb., package extra.
DINITROBENZENE.—7½d. per lb.
DINITROCHLORBENZENE, SOLID.—£72 per ton.
DINITROTOLUENE.—48/50° C., 8½d. per lb.; 66/68° C., 10d.
DIPHENYLAMINE.—Spot, 2s. per lb., d/d buyer's works.
α-NAPHTHOL.—Spot, 2s. 4d. per lb., d/d buyer's works.
β-NAPHTHOL.—In bags, £88 15s. per ton; in casks, £89 15s.
a-NAPHTHYLAMINE.—Lumps, 1s. per lb.; ground, 1s. 0½d. in casks.
β-NAPHTHYLAMINE.—Spot, 2s. 9d. per lb., d/d buyer's works in casks.
o-NITRANILINE.—3s. 11d. per lb.
m-NITRANILINE.—Spot, 2s. 7d. per lb., d/d buyer's works.
p-NITRANILINE.—Spot, 1s. 8d. to 2s. 1d. per lb. d/d buyer's works.
NITROBENZENE.—Spot, 4½d. to 5d. per lb., in 90-gal. drums, drums extra. 1-ton lots d/d buyer's works.
NITRONAPHTHALENE.—9d. per lb.; P.G., 1s. 0½d. per lb.
SODIUM NAPHTHIONATE.—Spot, 1s. 9d. per lb., 100% d/d buyer's works.
o-TOLUIDINE.—10½d. per lb., in 8/10-cwt. drums, drums extra.
p-TOLUIDINE.—1s. 10½d. per lb., in casks.
m-XYLIDINE ACETATE.—4s. 3d. per lb., 100%.

Latest Oil Prices

LONDON, April 7.—LINSEED OIL was quiet. Spot, £32 15s. (small quantities); April, £30 2s. 6d.; May-Aug., £30 5s.; Sept.-Dec., £30 12s. 9d., naked. SOYA BEAN OIL was steady. Oriental (bulk), afloat, Rotterdam, £28 15s. RAPE OIL was steady. Crude, extracted, £36; technical refined, £37, naked, ex wharf. COTTON OIL was firm. Egyptian crude, £30 15s.; refined common edible, £34; deodorised, £36, naked, ex mill (small lots £1 10s. extra). TURPENTINE was easy. American, spot, 40s. per cwt.

HULL.—LINSEED OIL, spot, quoted £30 15s. per ton; April, £30 2s. 6d.; May-Aug., £30 7s. 6d.; Sept.-Dec., £30 12s. 6d. COTTON OIL, Egyptian, crude, spot, £31; edible, refined, spot, £33 15s.; technical, spot, £33 15s.; deodorised, £35 15s., naked. PALM KERNEL OIL, crude, f.m.q., spot, £33, naked. GROUNDNUT OIL, extracted, spot, £33 10s.; deodorised, £36 10s. RAPE OIL, extracted, spot, £35; refined, £36. SOYA OIL, extracted, spot, £33 10s.; deodorised, £36 10s. per ton. COD OIL, f.o.r. or f.a.s., 27s. 6d. per cwt. in barrels. CASTOR OIL, pharmaceutical, 46s.; first, 41s.; second, 39s. TURPENTINE, American, spot, 42s. per cwt.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

Mortgages and Charges

(NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every company shall, in making its Annual Summary, specify the total amount of debt due from the company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.)

LAWRENCE AND MAYO, LTD., London, W.C., manufacturers of scientific instruments, etc. (M., 10/4/37.) March 23, £750 debentures, part of £3,000 already registered. *£2,200. March 10, 1936.

Satisfactions

GROSE AND STOCKER, LTD., Stoke-on-Trent, dealers in china clay, etc. (M.S., 10/4/37.) Satisfaction March 25, of debentures registered July 17, 1925, to extent of £18,000.

I.C.I. (AIKALI), LTD. (late Brunner, Mond and Co., Ltd.), London, S.W. (M.S., 10/4/37.) Satisfaction March 24, of mortgage registered November 28, 1927.

County Court Judgments

(NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court Judgments against him.)

GUNN, ROBT. W., 15 Devon Crescent, Billingham, chemical worker. (C.C., 10/4/37.) £20 11s. 6d. March 10.

HOLLAND, G. (male), 17 Hullard Street, Old Trafford, manufacturing chemist. (C.C., 10/4/37.) £13 5s. 0d. March 3.

NAYLOR, RCHD., 125 Lightoaks Road, Salford, chemical dealer. (C.C., 10/4/37.) £43 8s. 1d. February 23.

RAY MOULDINGS, LTD., 3 Plant House, Lingfield Avenue, Ealing, plastic moulders. (C.C., 10/4/37.) £13 12s. 3d. March 3.

Companies Winding-up Voluntarily

THE COLNE VALE DYE AND CHEMICAL CO., LTD. (C.W.U.V., 10/4/37.) By special resolution April 2. Frederick White, 78 John William Street, Huddersfield, appointed liquidator.

THE JOHN METCALF CHEMICAL CO., LTD. (C.W.U.V., 10/4/37.) By special resolution, March 31. Frank L'Estrange Heppard, 51 Ainsworth Street, Blackburn, appointed liquidator.

Books Received

Report on Economic and Commercial Conditions in the United States of America. December, 1936. By H. C. Chalkley. London: His Majesty's Stationery Office. Pp. 205. 3s.

Report on Economic and Commercial Conditions in French West Africa. 1933-1936. By Victor V. Cusden. Including Report on the Cameroons under French Mandate. By W. Darwall. London: His Majesty's Stationery Office. Pp. 67. 1s. 3d.

APPOINTMENTS VACANT

(2d. per word; minimum 18 words; 3 or more insertions, 1½d. per word per insertion. Sixpence extra is charged when replies are addressed to box Numbers.)

CHEMIST wanted—inorganic—graduate preferred, for factory in North of England. Previous works experience essential. Write giving full particulars, with indication of salary expected, to Box No. 1837, THE CHEMICAL AGE, 154 Fleet Street, E.C.4.

UNIVERSITY graduates with chemical training, age 25 to 30, required as trainees for the technical staff of well known company dealing with industrial water treatment problems. Business of works experience and knowledge of water treatment advantageous. Men must have had first-class education and be of good social standing in view of the possibility of their being required to go abroad at some future date. Full details, age, education, experience, training, etc., to Box No. 1838, THE CHEMICAL AGE, 154 Fleet Street, E.C.4.

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CHARCOAL, ANIMAL and VEGETABLE, horticultural, burning, filtering, disinfecting, medicinal, insulating; also lumps ground and granulated; established 1830; contractors to H.M. Government.—THOS. HILL-JONES, LTD., "Invicta" Mills, Bow Common Lane, London, E. Telegrams: "Hill-Jones, Bochurch, London." Telephone: 3285 East.

COPPER Vacuum Pan, Autoclaves, and Jacketted Pans, also Gravity Rolls. C. F. DAVIS, LTD., 60 Hatcham Road, London, S.E.15.

FOR SALE 5—4 in. Flanged Angle and Tee Acid Resisting Valves, £17 10s. 0d. Also one Wells No. 5 Oil Filter, £5 10s. 0d. S. S. Cowell and Son, at St. Stephens Ironworks, Norwich.